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ORGANIZATION AND RETURNS OF STONE FRUIT AND PEAR ENTERPRISES IN THE OKANAGAN VALLEY, BRITISH COLUMBIA 1949 - 1950

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DEPARTMENT OF AGRICULTURE

Economics Division Marketing Service

Ottawa, December, 1952

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SUMMARY

1. This study of farm organization, cultural practices, expenses and returns in stone fruit and pear production includes 107 fruit farms in that section of the Okanagan Valley which extends from Kelowna to Osoyoos. The farms surveyed comprise a total of 1,121 acres of orchard, the trees of which produced a total of $599,250 worth of fruit in 1949.

2. Plantings of stone fruit and pear trees in the Okanagan Valley have been made on such a scale since 1939 that by 1949 the production of apricots, cherries, peaches, plums and prunes had more than doubled, while pear production had increased by more than one-half.

3. The average yield in tons per acre for the various fruits was as follows: apricots 7.6 tons, cherries 4.6 tons, peaches 6.9 tons, plums 5.2 tons, prunes 8.6 tons, pears seven tons, and apples eight tons.

4. Eighty-one per cent of all the apricot trees, 52 per cent of the cherry trees, 82 per cent of the peach trees, 67 per cent of the plum trees, 82 per cent of the prune trees, and 83 per cent of the pear trees were 15 years old or less.

5. On the basis of age distribution of the trees and taking account of the losses from the cold weather an increase in the production of apricots is anticipated in the next few years. Peach and cherry production will decrease unless better cultural practices and favourable weather conditions bring forth higher average yields per tree. All signs point to a continuing increase in the production of pears in the Okanagan Valley, and a slight increase in plum and prune production.

6. At present the domestic market utilizes the stone fruits and pears produced in the Okanagan Valley.

7. The average total investment per farm was $24,552 of which 68 per cent was invested in land. The average value of orchard land was $1,554 per acre.

8. The average acreage of orchard per farm was 10.5 acres, consisting of 1.3 acres of apricot trees, 1.4 acres of cherry trees, 2.6 acres of peach trees, 0.9 acres of plums and prunes, 1.5 acres of pears, and 2.8 acres of apples. The remainder of the farm acreage was made up of 0.3 acres of ground or field crops, 0.8 acres of unimproved land, and 0.4 acres of farmstead.

9. Total cash receipts averaged $6,016 per farm. Of this total 28 per cent was derived from the sale of peaches, 25 per cent from cherries, 15 per cent from apples, 12 per cent from apricots, ten per cent from pears, five per cent from plums and prunes, and the remainder from ground crops, outside work, and the sale of livestock or livestock products.

10. Total current expenses averaged $3,224 per farm. Hired labour accounted for 44.7 per cent of this total, operation of equipment 11.2 per cent, custom work 7.3 per cent, and fertilizers 7.2 per cent.

11. Labour earnings averaged $2,040 per farm and ranged from - $1,293 to $11,059.

12. The wide variation in labour earnings was due in part to differences in yield, size of farm, labour productivity, degree of diversification, quality and kind of fruit, location and management.

13. The number of man-hours of labour required to produce an acre of apricots was 469 hours, an acre of cherries 555 hours, an acre of peaches 384 hours, an acre of prunes 242 hours, and an acre of pears 351 hours.

14. The net returns from an acre of apricots in 1949 were $634.74, an acre of cherries $875.27, an acre of peaches $292.54, an acre of prunes - $26, and an acre of pears $317.59.

INTRODUCTION

The main stone fruit and pear belt of the Okanagan Valley lies between Kelowna and Osoyoos. In the last ten years the acreage utilized by stone fruit and pear trees has been increasing while the acreage utilized by apple trees has been decreasing. Present deterioration of the apple market presages further increases in the plantings of stone fruit and pear trees, and thus an increased production of these fruits.

At the request of the industry a survey of orchards, comprising mostly stone fruit or pear trees, was undertaken in the summer of 1950. The objectives of this survey were: (1) to study the organization, expenses and returns of these fruit farms; (2) to obtain information on the practices used in the production of stone fruits and pears; (3) to determine the labour requirements and yields of stone fruit and pear trees; (4) to supplement the 1949 apple production survey and thus complete the description of the post-war tree fruit industry in the Okanagan Valley.

METHOD OF STUDY

The area included in this survey was that portion of the Okanagan Valley extending from Kelowna to Osoyoos. Through personal interviews, complete records of the farm business for the year 1949-50 were obtained from 107 orchardists. The survey was limited to those orchards where stone fruit or pear trees predominated.

Very few orchards were made up entirely of one kind of fruit tree, most farms producing some of each kind of fruit grown in the locality. In all a total of 1,121 acres of orchard, having a total of 95,668 trees of numerous kinds and ages were included. Eighty-three per cent of these trees were either stone fruit or pear trees.

Since the survey area contains 12 separate irrigation districts, with climatic, soil and cropping differences, the 107 orchard records were sorted into five groups called "regions" for purposes of analysis. These regions are:

1. Kelowna Region including Kelowna, East Kelowna and Westbank,
2. Summerland Region including Summerland and Peachland,
3. Penticton Region including Penticton, Naramata and Kaleden,
4. Oliver Region including Oliver and Okanagan Falls,
5. Osoyoos Region including the area about Osoyoos and Keremeos.

To secure information about specific fruit enterprises the operators were asked to apportion to particular kinds of tree fruit, the expenses and time spent on various orchard operations. Many growers were able to do this and, thus, made it possible for the data to be analysed on the basis of kind of tree fruit.

THE AREA

Location.- The Okanagan Depression is located in south-central British Columbia and forms the most important part of what is known as the Central Interior Plateaux Region. In Canada it extends in a northerly direction from the 49th Parallel to 50°45' North, longitude 119°30' West. The valley floor is rarely higher than 800 feet but lake levels range from 903 feet above sea level at Osoyoos Lake at the southern extremity of the Canadian section of the valley to 1,122 feet above sea level at Okanagan Lake. The Depression contains the many-armed Shuswap Lake in the north, the long, narrow Okanagan Lake, and the Okanagan River flowing through Skaha, Vaseaux and Osoyoos Lakes in the south. The northern section is drained into the Fraser River basin while Lake Okanagan is drained by the Okanagan River into the Columbia River, south of the border. Sixty per cent of the Depression is covered by water and the valley slopes up moderately to rounded, rolling-topped uplands of 4,000 to 6,000 feet. Lakes and bogs found in these wooded uplands are dammed back and used to supply irrigation water for the fertile "bench-lands" of the valley. 1/

The valley proper is narrow, particularly below the approximate half way point of Lake Okanagan. At this point on the East side of the Lake is situated the city of Kelowna; that part of the valley which lies south of this point is the area in which the survey was conducted. This section of the valley is a single narrow trough, ranging from three to six miles wide for approximately 95 miles to the Canadian-American Boundary.

Soils.- The soil of the valley is of glacial origin and its chemical constitution varies little and then only as a result of water sorting. It is chiefly deficient in boron and requires some nitrogen since, prior to its present use, the valley was an arid area supporting but a sparse vegetation.

The glacial till was laid down in "bench" or terrace formations as the water receded to the present lake levels. These terraces of laminated silt, which flank the valley sides and fill the bottom, are of feldspathic rock flour, a creamy white colour which may sometimes be overlaid by sands and gravels. They are often narrow "benches" with rock outcroppings. At lake-side the terraces are sharply cliffed but above are separated by moderate slopes. Although the depth of this soil varies from terrace to terrace, all benches are several hundred feet thick. In the drier and lower elevations, especially in the extreme southern portion of the valley, brown soils have developed. 2/

There are no more than 400,000 acres of arable land in the valley and all but a few small areas must be irrigated. Approximately 50,000 acres

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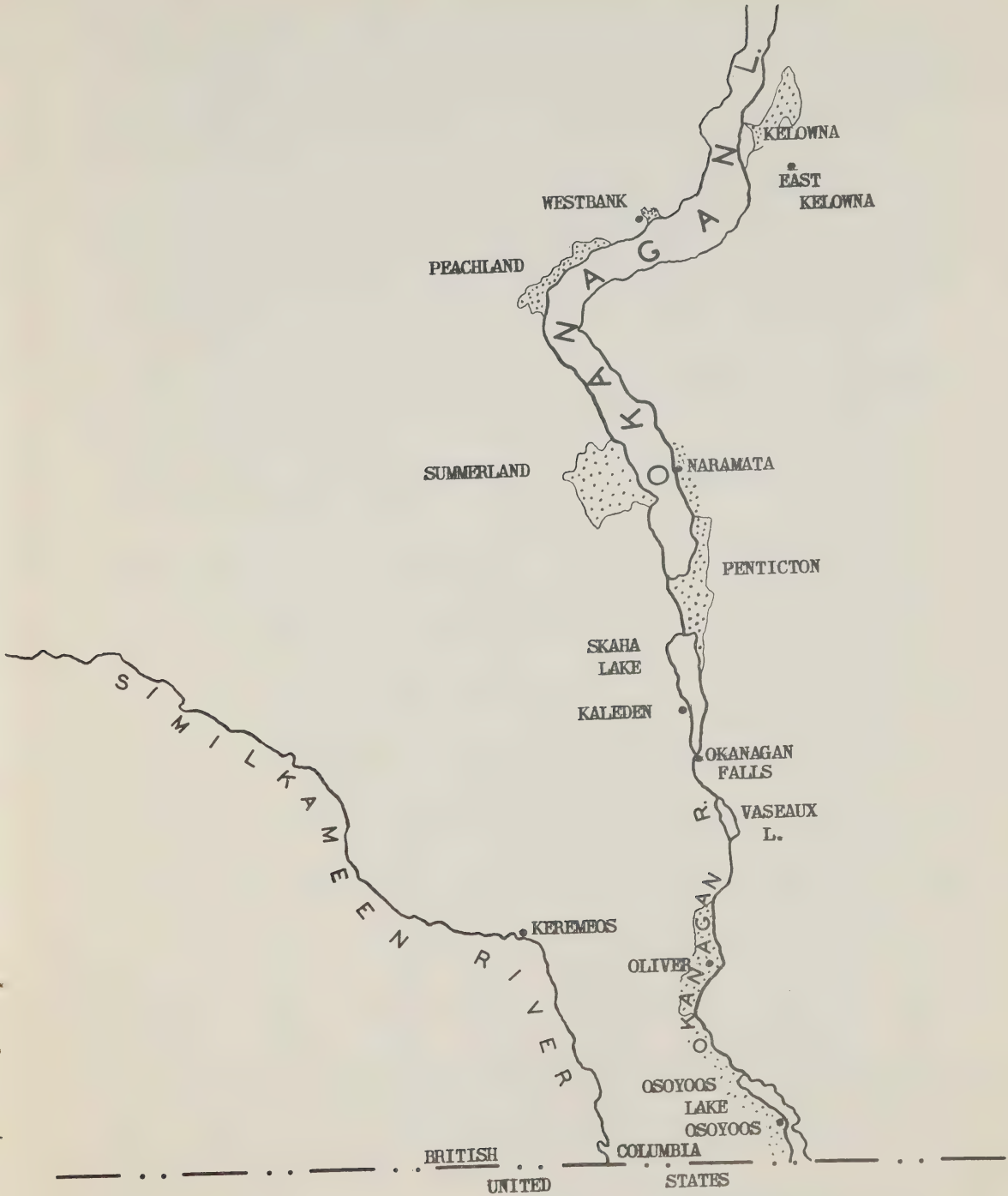
1/ Kelley, C.C., and Spilsbury, R.H., Soil Survey of the Okanagan and Similkameen Valley, British Columbia, Report No. 3 of B.C. Survey, Department of Agriculture, Ottawa, 1949.

2/ Brink, V.C., and Farstad, L., "The Physiography of the Agricultural Areas of British Columbia", Scientific Agriculture, June 1949, Vol. 29, No. 6, Agricultural Institute, Ottawa, Canada, pp. 282-286



Map of the Southern Okanagan Valley, B.C., Showing the Area Surveyed.

are utilized, mostly the white silts. 1/

The Similkameen Valley almost parallels the southern part of the Okanagan Valley geographically and in natural conditions. Its width ranges from 1½ to 2½ miles from Keremeos to the border and it is estimated that 1,420 acres are under irrigation.

Climate.- The Okanagan Valley has a series of climatic zones which determine the variations in native plant life. The mixed forest region in the north changes gradually to desert flora in the south. This change from a cool zone to succeedingly warmer desert zones is accompanied by a lengthening of the growing season which influences cropping practices to a marked degree. In general the climate tends to be of continental type but the lakes modify the temperature to a considerable degree.

During the winter of 1948-49 there was a comparatively heavy fall of snow and cold weather prevailed throughout the valley until March. The spring was dry and there was even less than usual summer rainfall. Because of this dry weather, losses from disease were small and harvesting conditions were excellent. However, there were several hail storms throughout the year and the most serious damage was sustained at Kelowna and Naramata. Prior to 1948 there had been no hail damage in the Naramata district for 15 years.

The following winter, 1949-50, was considered to be the coldest the Okanagan Valley has had for many years. In the month of January a low of -18°F. was recorded at Oliver and a low of -22°F. at Summerland. 2/ The cold was prolonged and accompanied by heavy snowfalls, but at Osoyoos and Keremeos the snow drifted and left the ground exposed in many places. Due to the sustained cold, many fruit trees were killed or damaged.

In Table 1 the most important climatic factors are listed. The frost-free period as defined in this study is the number of days between the last date in

Table 1.- Altitude, Frost-Free Period, Growing Period, Precipitation, Extreme Temperature and Mean Temperature, Okanagan Valley, B.C.

Station	Altitude	Frost-free period	Growing period	Precipitation		Temperature		
				Annual	Summer	Highest	Lowest	Year average
	- feet -		- days -	- inches -		- degrees F. -		
Kelowna	1,200	150	204	12.39	2.68	107	-17	47
Summerland	1,300	176	216	10.77	2.97	104	-22	48
Penticton	1,132	152	218	11.36	3.34	105	-12	48
Oliver	995	162	225	9.62	2.69	111	-21	50
Keremeos	1,165	188	221	9.76	2.46	106	-20	49

Source: British Columbia, Department of Agriculture, Climate of British Columbia, Report for 1949, Victoria, B.C., 1950, pp. 16-17.
Kelley, C.C., Spilsbury, R.H., Soil Survey of the Okanagan and Similkameen Valley, British Columbia, Department of Agriculture, Ottawa, 1949, p. 11.

1/ Ibid, p. 285.
2/ British Columbia, Department of Agriculture, Forty-fifth Annual Report, Victoria, B.C., 1950, p. 101.

the spring on which the temperature of 32°F. is recorded, and the first similar condition in the fall. The growing period is defined as the number of days with an average daily temperature above 43°F. The figures given for the frost-free period and length of growing season are averages obtained for ten-year periods; those for precipitation and mean temperature are averages for periods of at least 20 years.

Irrigation.- Commercial fruit production is dependent upon the water provided by the various irrigation systems. The 12 irrigation districts in the section surveyed are: Black Mountain, South East Kelowna, Okanagan Mission, Westbank, Peachland, Summerland, Naramata, Corporation of Penticton, Kaleden, Okanagan Falls, Southern Okanagan Lands Project, and Keremeos. In addition there are several privately owned systems serving one or more farms.

The cost of supplying the water and maintaining the storage system and flumes is met by charging an annual tax on each irrigated acre. Irrigation charges vary greatly between the different districts due to - (a) accessibility of the water supply, (b) cost of maintenance, (c) amount of debt outstanding against the entire system(s). The water charge made by these 12 districts varies from a low of $9 to a high of $28 per acre per annum. The modal rate is $13 to $15 per acre per annum.

THE REGIONS

As stated under "Method of Study" the records were sorted into five groups called regions for purposes of analysis. Following is a brief description of the five regions.

Kelowna.- The Kelowna region is famous for its apples, and is also the most important pear and cherry region in the interior of British Columbia. About the city of Kelowna the land is low and flat for about four miles from the edge of the lake to the first bench. The soil of the flats is a rich black loam; on the benches there is light sandy loam with gravel sub-soil.

Westbank is a compact area lying southwest of Kelowna on the opposite side of Lake Okanagan. In this locality 25 per cent of the 697 acres under irrigation are planted to stone fruits or pears. 1/ The soil varies from whitish clay silt to sandy loam.

Summerland.- The orchards in this district, on the west side of Okanagan Lake, are situated on bench lands which rise from 200 to 400 feet above the lake level. The area is a large producer of apricots and peaches. Soils vary from the gravelly to the sand loam types. At Summerland the benches undulate gradually upward, while the orchards at Peachland, 14 miles to the north, are on steep hillsides and benchlands. Sixty per cent of the trees in these orchards are either stone fruit or pear trees.

Penticton.- At Penticton, located south of Okanagan Lake, the fruit tree land consists mostly of benches about a mile wide, lying between the

1/ Recommendations of the Okanagan Agricultural Club, Committee on Post War Rehabilitation, Kelowna, 1948, Chapt. I.

lake and foothills of the Gold Range. The soil consists of deep silt deposits of clay and very fine sand, and is rated one of the most fertile and productive types of soil in the Okanagan Valley.

Naramata, on the east side of Okanagan Lake, across from Summerland, has some 800 acres of orchard of which approximately 33 per cent are either stone fruit or pear trees. The area is a narrow strip of bench land about five miles in length, rolling with deep slopes and gullies.

Nine miles south of Penticton on the west side of Skaha Lake is Kaleden. Here the orchards are planted on bench lands rising abruptly from the lake. The soil is a deep sandy loam.

In the Penticton region only 34 per cent of the total fruit crop has usually consisted of stone fruits or pears.

Oliver.- Twenty-five miles south of Penticton, on the Okanagan River between Vaseaux Lake and Osoyoos Lake, is Oliver, the centre of Canada's apricot production. This region has more acres of apricot and peach trees than any other in the valley. The climate is most favourable for stone fruit production. The soil is a deep sandy loam.

Okanagan Falls, at the southern end of Skaha or Dog Lake, is 11 miles north of Oliver. Here the area available for fruit growing is limited and its use is divided between fruit trees, ground crops, and cattle raising.

Osoyoos.- Osoyoos lies three miles north of the International Boundary on the west side of Osoyoos Lake. Much of the land is double cropped and cantaloupes, tomatoes, cucumbers and zucca melons are grown extensively as well as apricots, peaches and early varieties of apples. In this region the soil is a brown sandy loam and experience has shown that only the better soil is suitable for fruit trees. Losses have been heavy from plantings on poorer lots.

Keremeos, situated in the Similkameen Valley, is similar in temperature to Osoyoos and has been included with Osoyoos for this reason and because of the ground crops produced in both centres. The soils in the 1½ to 2½ mile-wide valley bottom range from sandy to gravelly loams. In order of importance, plantings comprise apples, pears, ground crops and stone fruits.

FARM OPERATORS AND THEIR FAMILIES

Length of Residence.- Fifty-one of the orchardists interviewed had lived on their farms for less than eight years, 34 for eight to 15 years and 22 had occupied their premises for 16 years or more. It is thus apparent that almost one-half of the operators settled in the Okanagan during the early 1940's. Indeed, in the area from Kelowna to Osoyoos, many of the 13,000 inhabitants who came between 1941 and 1947 took up farming as a means of livelihood. 1

1/ British Columbia, Department of Trade and Industry, Regional Index of British Columbia, Victoria, B.C., 1948, pp. 52-62.

Age.- Two per cent of the operators were under 31 years of age; 46 per cent between 31 and 45 years; 36 per cent between 46 and 60; and 16 per cent were 61 years of age or older. Provided normal circumstances prevail it is not likely that many of these operators will retire from farming within the next few years.

Means of Farm Acquisition.- The majority of the farmers purchased their orchards from private individuals. Others purchased from government agencies such as the Soldiers' Settlement Board, the Veterans Land Act or the Southern Okanagan Lands Project. A few of the operators had inherited their property.

Number of Persons per Family.- The average number of persons living in the farm home was 3.5, consisting of 2.5 adults and one child. Persons 15 years of age or older were classed as adults for purposes of this study.

PRODUCTION AND PLANTINGS

The factors determining total fruit production in any one year include the number of trees, their age distribution, the variety of fruit grown, the amount of cultural care, the prevalence of disease and pests, and the weather. In addition, location and management will cause variations in yield between different orchards.

Data on production of stone fruits and pears in the Okanagan Valley from 1930 to 1949 are presented in Table 2. The year 1949 was the peak production year for apricots, cherries, peaches, and plums and prunes, while the largest production of pears occurred in 1946. On a percentage basis the average production of apricots for the three-year period 1947-49 was 110 per cent greater than the average production for the three-year period 1939-41. Comparing the same periods, the production of cherries increased by 110 per cent, peaches by 214 per cent, plums and prunes by 141 per cent, and pears by 89 per cent. An indication of the trends in production is thus given. The five-year moving averages for the production of stone fruit and pears in the Okanagan Valley are shown in Figures 1-4.

As indicated in Table 2, the production of apricots was very small in 1936. This was due to the cold weather which prevailed during that year.

Although information regarding annual production is usually helpful in predicting future production, the available data do not indicate that farmers may expect a poor crop every five or six years.

Average Yield - 1949.- For the 107 orchards studied, the yields varied between regions and between orchards. The average yield per bearing tree, in pounds packed, for the whole area was as follows: apricots 152 lbs., cherries 183 lbs., peaches 138 lbs., plums 104 lbs., prunes 171 lbs., pears 143 lbs., and apples 353 lbs. (Table 3).

The apricot, cherry and peach trees in the Penticton region had, on the average, the highest yield while prune and plum trees yielded more per tree in the Osoyoos region. Pears did equally well at Summerland and Penticton in 1949.

Table 2.- Annual Production of Stone Fruits and Pears, Okanagan Valley, 1930 - 1949

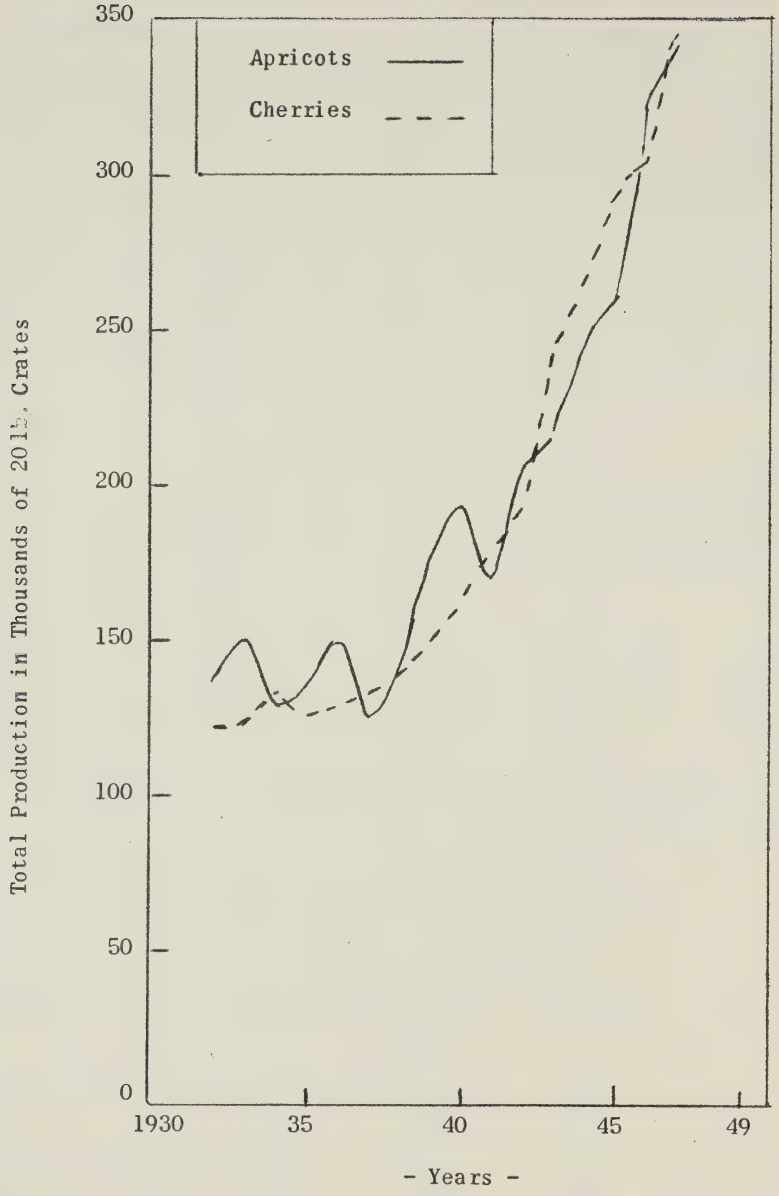
Year	Apricots (20 lb. crates)	Cherries (20 lb. crates)	Peaches (20 lb. crates)	Plums-Prunes (15 lb. crates)	Pears (42 lb. crates)
			- thousands -		
1930	33	99	163	226	139
1931	121	85	125	178	153
1932	136	145	246	274	130
1933	102	120	219	222	225
1934	301	160	316	334	218
1935	99	102	132	325	226
1936	4	128	81	209	228
1937	158	114	415	288	268
1938	187	132	388	325	334
1939	176	177	526	363	304
1940	168	146	571	314	283
1941	189	177	691	587	331
1942	243	182	952	382	322
1943	62	218	481	537	314
1944	363	255	1,302	863	497
1945	216	390	1,626	1,028	543
1946	367	278	1,660	1,008	666
1947	290	333	1,880	1,008	571
1948	379	269	1,814	932	584
1949	451	449	1,923	1,112	580

Source: British Columbia, Department of Agriculture, Agricultural Statistics Report, Victoria, 1930-1949.

Table 3.- Average Yield per Bearing Tree by Regions, 107 Okanagan Valley Orchards, 1949-1950

Type of fruit	Average per bearing tree [a]					
	Kelowna	Summerland	Penticton	Oliver	Osoyoos	All Okanagan
			- pounds -			
Apricots	88	132	174	170	129	152
Cherries	134	124	274	256	180	183
Peaches	82	158	187	131	97	138
Plums	99	130	89	122	195	104
Prunes	138	153	187	191	225	171
Pears	118	168	168	118	67	143
Apples	252	378	378	546	336	353

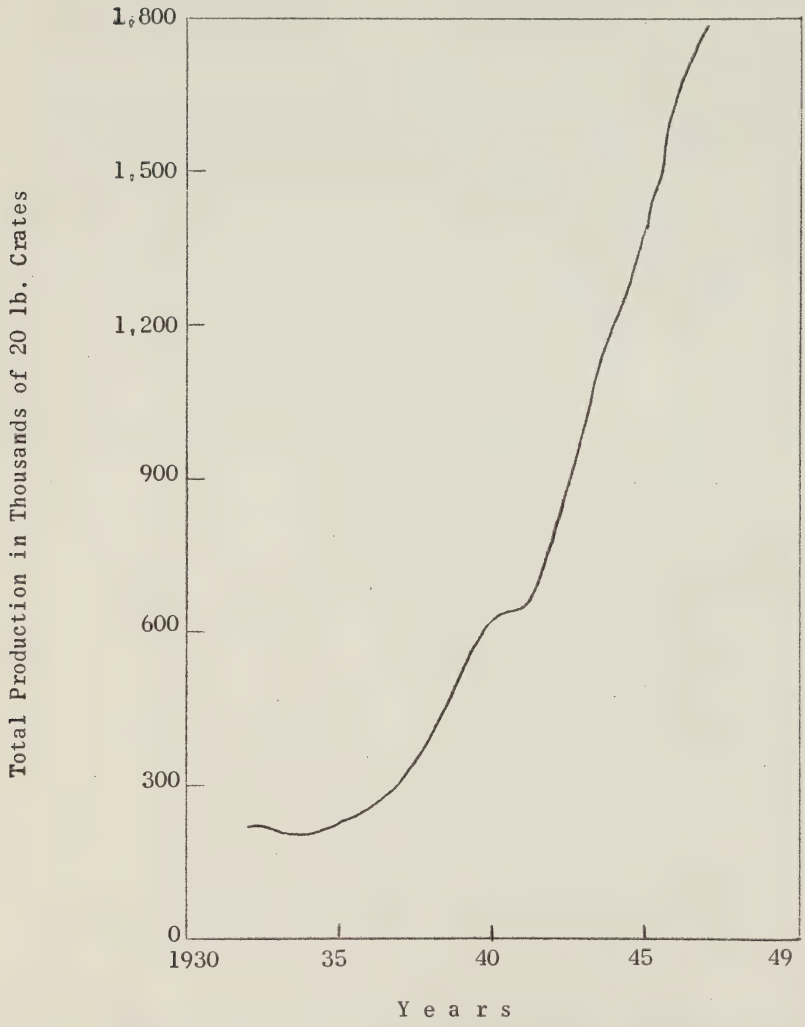
a/ All trees under five years were considered non-bearing; peach trees over five were considered full bearing; other trees between five and ten years were counted as half bearing for purposes of this study.



Source.- Agricultural Statistics Report, Victoria, B.C. Department of Agriculture, 1930 - 1949, pp. 18 - 21

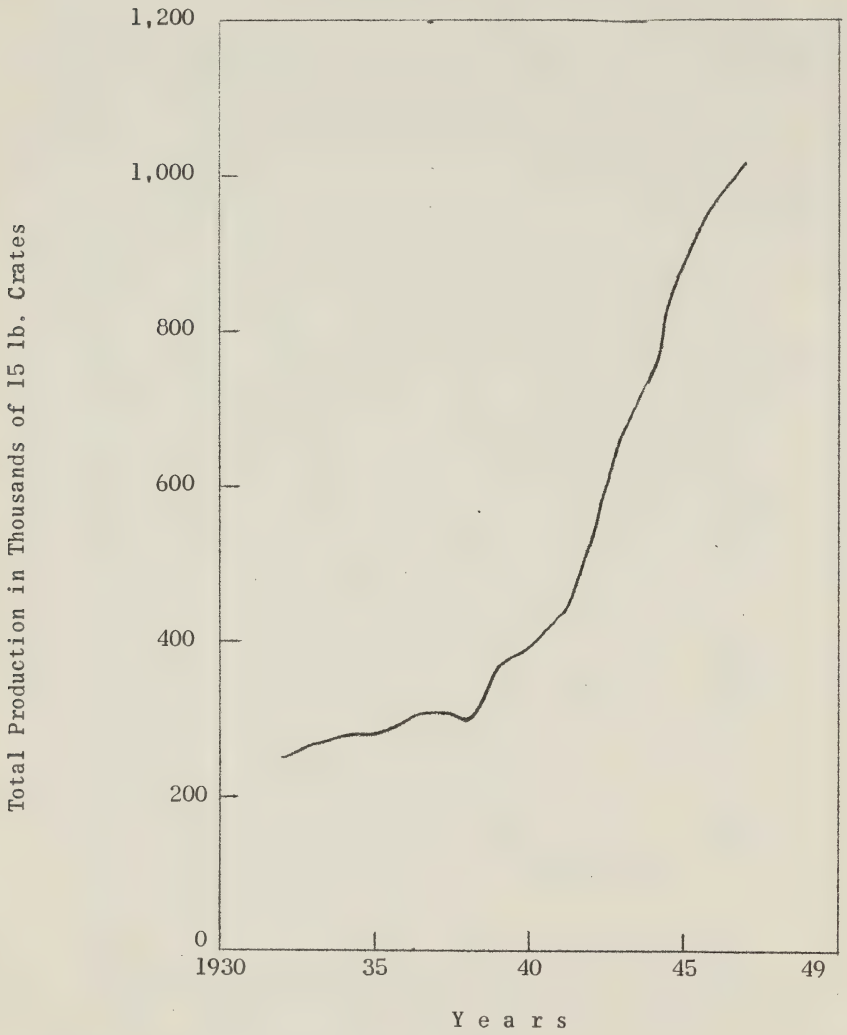
Figure 1.- Production of Apricots and Cherries, Five Year Moving Average, Okanagan Valley, 1930-1949

Figure 2.- Production of Peaches, Five Year Moving Average, Okanagan Valley, B.C. 1930 - 1949



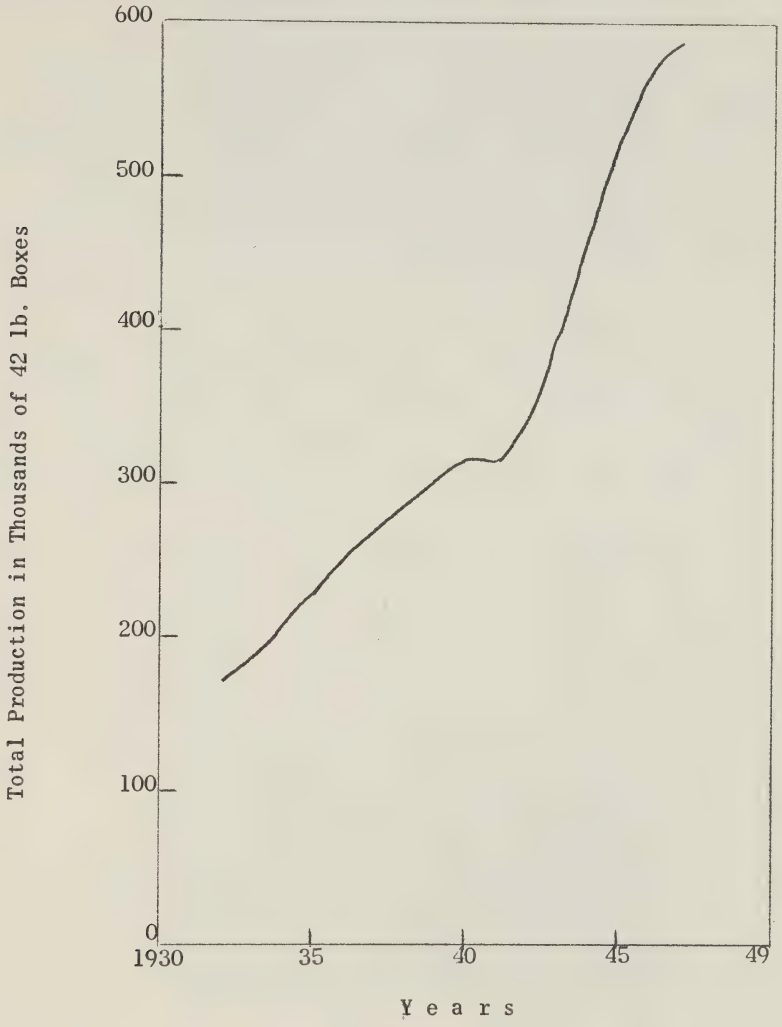
Source.- Agricultural Statistics Report, Victoria, B.C. Department of Agriculture, 1930 - 1949, pp. 18 - 21.

Figure 3.- Production of Plums and Prunes, Five Year Moving Average, Okanagan Valley, B.C. 1930-1949



Source.- Agricultural Statistics Report, Victoria, B.C. Department of Agriculture, 1930 - 1949, pp. 18 - 21

Figure 4.- Production of Pears, Five Year Moving Average, Okanagan Valley, B.C. 1930 - 1949



Source.- Agricultural Statistics Report, Victoria, B.C. Department of Agriculture, 1930 - 1949, pp. 18 - 21.

Assuming 100 trees per acre for apricots, peaches, plums, prunes and pears and 50 trees per acre for cherries and apples, the average yield in tons per acre would be: apricots 7.6 tons, cherries 4.6 tons, peaches 6.9 tons, plums 5.2 tons, prunes 8.6 tons, pears 7.0 tons and apples 8.0 tons.

Trend in Plantings.- In 1945 the stone fruit and pear population of the survey area numbered 736,760 trees. 1/ This was 53 per cent of the total trees in the area. Compared with the year 1940 it was an increase of 12 per cent and could, therefore, be expressed as a 12 per cent decrease in the number of apple trees. Of all the fruits, peach, pear and apricot trees showed the greatest increases in numbers, namely 110,535, 72,524 and 37,253 trees, respectively. These new plantings account in a large measure for the increased production of these fruits in the 1947-49 period.

Table 4.- Number of Stone Fruit and Pear Trees, Kelowna to Osoyoos, 1925-1945

Kind of tree	Year									
	1925		1930		1935		1940		1945	
	No.	% of total	No.	% of total	No.	% of total	No.	% of total	No.	% of total
Apricots	49,215	6	41,654	5	54,460	5	43,667	4	80,920	6
Cherries	27,255	3	27,005	3	38,242	4	41,661	4	60,144	4
Peaches	51,590	6	45,930	5	128,967	12	177,336	15	287,871	21
Plums	14,135	2	11,329	1	12,196	1	11,729	1	12,888	1
Prunes	14,935	2	13,072	1	30,550	3	58,420	5	89,433	6
Pears	58,299	7	69,191	8	91,418	9	132,980	12	205,504	15
Apples	640,661	74	684,272	77	690,166	66	681,806	59	656,235	47
Total	856,090	100	892,453	100	1,045,999	100	1,147,599	100	1,392,995	100

Source: Orchard Survey of the Okanagan Horticultural District, 1925-1945.

Principal Varieties of Fruits Grown.- The principal varieties of apricots in the orchards surveyed were Moorpark, Blenheim and Tilton. They comprised 63 per cent, 11 per cent and 11 per cent, respectively, of the total number of apricot trees in the survey. Bings accounted for 45 per cent and Lamberts for 37 per cent of the total cherry plantings. The main varieties of peaches grown were Elberta, 31 per cent, Veteran, 26 per cent, and J.H. Hale, 14 per cent. Bartlett pears predominated in all districts and comprised 86 per cent of the total; D'Anjou pears were second with eight per cent. The chief varieties of plums were Bradshaw, 39 per cent, Peach plums, 36 per cent, and Greengage, 10 per cent. The Italian prune is the only commercial prune produced in the Okanagan Valley.

The varieties of fruit recommended for commercial plantings in the Okanagan Valley are determined by their hardiness and their marketability. Some of the newer varieties recommended by the B.C. Fruit Growers Association for commercial planting are: - apricots - Perfection and Reliable; cherries -

1/ Orchard Survey of the Okanagan Horticultural District, Department of Agriculture, Victoria, B.C., 1945.

Peach Trees at Picking Time

Pear Orchard Aged 10-12 Years

Van and Star; peaches - Redhaven and Spotlight; plums - none recommended, and prunes - De Maris and Greata.

Age of Trees.- The distribution of the stone fruit and pear trees by age groups is illustrated in Table 5. This table indicates how many trees can be considered as non-bearing, bearing, or due for replacement.

Table 5.- Distribution of Stone Fruit and Pear Trees by Age Groups, 107 Okanagan Valley Orchards, 1949-1950

Age group	Kind of Tree											
	Apricots		Cherries		Peaches		Plums		Prunes		Pears	
	No.	% of total	No.	% of total	No.	% of total	No.	% of total	No.	% of total	No.	% of total
1 - 5	4,404	31	855	11	3,388	11	74	6	1,288	14	3,224	19
6 - 10	4,466	32	1,565	20	13,149	44	359	29	3,458	38	6,660	39
11 - 15	2,467	18	1,647	21	8,188	27	391	32	2,720	30	4,222	25
16 - 20	1,594	11	606	8	4,059	13	56	5	525	6	1,647	9
21 - 25	293	2	1,540	19	684	2	56	5	49	1	466	3
26 - 30	310	2	786	10	170	1	40	3	93	1	528	3
Over 30	555	4	900	11	450	2	252	20	855	10	386	2
Total	14,089	100	7,899	100	30,088	100	1,228	100	8,988	100	17,133	100

Sixty-three per cent of the apricot trees on the 107 orchards were under ten years of age; 18 per cent between 11-15 years of age; 11 per cent between 16-20 years of age and ten per cent were over 20 years of age.

Cherries were fairly evenly distributed in all age groups except in the 16-20 year group, few cherry trees having been planted during the depression years of the early 1930's. It is a common practice among the orchardists to plant a few new trees each year. This practice tends to perpetuate the orchards.

Eleven per cent of the peach trees can be considered as non-bearing since they were between 1-5 years; 44 per cent were between 6-10 years; 27 per cent were between 11-15 years; and 13 per cent of the trees were at or near their maximum bearing age, that is, 16-20 years.

The bulk of the plum and prune trees were between six and 15 years of age and 38 per cent of the prune trees in this group were between six and ten years of age. Fourteen per cent of the prune trees had been planted only since 1945.

During the last 15 years there has been a considerable planting of pear trees. Eighty-three per cent of the total number of pear trees were 15 years old or less and 19 per cent of these trees were non-bearing in 1949 as they had been planted only since 1945. This accounts for the fact that there were but a few orchards where the major part of the farm income was derived from pears.

Table 6.- Number of Stone Fruit and Pear Trees Winter-Killed, as Reported by 107 Okanagan Valley Orchardists in 1949-1950

Age group	Apricots			Cherries			Peaches			Plums and Prunes			Pears		
	No.	% of total Apricots	% of age Group	No.	% of total Cherries	% of age Group	No.	% of total Peaches	% of age Group	No.	% of total P.& P.	% of age Group	No.	% of total Pears	% of age Group
1 - 5	978	6.9	22.2	42	.5	4.9	1,221	4.0	36.0	302	3.0	22.2	132	.8	4.1
6 - 10	891	6.3	19.9	392	5.0	25.0	4,277	14.2	32.5	340	3.3	8.9	436	2.5	6.6
11 - 15	335	2.4	13.6	416	5.2	25.2	2,846	9.4	34.8	185	1.8	6.0	76	.4	1.8
16 - 20	31	.2	2.0	38	.5	6.3	901	3.0	22.2	95	.9	16.0	17	.1	1.0
21 - 25	12	.1	4.1	337	4.3	21.9	146	.5	21.3	1	.01	1.0	4	.02	.9
26 - 30	7	.1	2.3	371	4.7	47.0	9	.02	5.3	5	.05	3.8	11	.1	2.1
Over 30	44	.3	7.9	474	6.0	52.7	280	.9	62.2	124	1.2	11.2	0	0	0
Total	2,298	16.3		2,070	26.2		9,680	32.02		1,052	10.3		676	3.92	

Winter Killing.- The orchardists were asked to estimate the number of their trees killed during the cold weather of the 1949-1950 season. Table 6 lists the estimated number of stone fruit and pear trees killed on the 107 orchards from which records were obtained.

Sixteen per cent of the apricots, 26 per cent of the cherries, 32 per cent of the peaches, ten per cent of the prunes and plums, and four per cent of the pears suffered winter damage. The total number of trees killed was 15,776 or 19.8 per cent of the 79,425 stone fruit and pear trees in the survey. An examination of the data presented in Table 6 indicates that, in general, the youngest and the oldest trees were the ones to suffer the most from the severe weather conditions prevailing during the winter of 1949-1950.

Future Production Trends.- As stated previously, future production of stone fruits and pears will be determined by: (1) acreage trends, influenced by the number of non-bearing trees coming into bearing and the number of old trees removed; (2) average yields, influenced by age distribution, changes in varieties, weather and cultural practices, and (3) market demand for the various kinds of fruit.

Table 7.- Age Distribution of Apricot and Peach Trees as of December 31, 1949 and December 31, 1954, 107 Okanagan Valley Orchards, 1949-1950

Age group (years)	Apricot Trees: Number as of Dec. 31, 1949	Apricot Trees: Trees to be removed	Apricot Trees: Number as of Dec. 31, 1954	Peach Trees: Number as of Dec. 31, 1949	Peach Trees: Trees to be removed	Peach Trees: Number as of Dec. 31, 1954
1 - 5	4,404	978	unknown a/	3,388	1,221	unknown a/
6 - 10	4,466	891	3,426	13,149	4,277	2,167
11 - 15	2,467	335	3,575	8,188	2,846	8,872
16 - 20	1,595	31	2,132	4,059	901	5,342
21 - 25	293	12	1,563	684	146	3,158
26 - 30	310	7	281	170	9	538
Over 30	555	44	814	450	280	331
Total 6 years and over	9,685		11,791	26,700		20,408

a/ Rate of replanting unknown. It is, therefore, impossible to estimate the number of trees.

As indicated in Table 5, 31 per cent of the apricot trees on the farms surveyed were under five years of age. Eleven per cent of the cherry and peach trees, 14 per cent of the prune trees and 19 per cent of the pear trees were in this same age group and thus may be considered as non-bearing.

By 1954, these trees will be reaching bearing age. The present 5-10 year group will have shifted into the 11-15 year group and the present 11-15 year group will have shifted into the 16-20 year age group. If one assumes a rate of tree removal equal to the number of winter-killed trees, he can then proceed to estimate the number of bearing trees on the 107 orchards in 1954. An estimate of the probable age distribution of these trees in December 1954 is presented in

Table 7, along with the actual age distribution in December 1949.

As indicated in Table 7, there were 9,685 apricot trees aged six years or older on these 107 orchards in 1949 and their number will probably reach 11,791 by 1954. The upward trend in apricot production in the Okanagan Valley is thus likely to continue. This forecast is made on the assumption that average yields will be maintained at present levels and cultural practices will not differ from those presently followed.

Peach production will follow a different trend. In 1949 there were 26,700 peach trees aged six years or older but this number is likely to be reduced to 20,408 by 1954. After 1954, however, the new plantings made in 1950-51 will be coming into bearing age.

Similar methods were used in forecasting the number of cherry, plum and prune, and pear trees. Estimates indicate that the number of cherry trees aged six years or older will decrease from 7,044 in 1949 to 5,829 in 1954. The number of plum and prune trees of the same age will increase from 8,584 to 9,164 and the number of pear trees from 13,909 to 16,457 during the same period. These figures indicate that in the next few years there will be a probable decrease in the production of cherries, a slight increase in the production of plums and prunes, and a rising trend in the production of pears in the Okanagan Valley.

MARKETS AND PRICES

The Okanagan Valley is the only centre of commercial apricot production in Canada. Seventy per cent of the apricot crop is absorbed by the fresh fruit markets of British Columbia and the three Prairie provinces; the remaining 30 per cent is utilized by processing plants in British Columbia.

Okanagan Valley cherries go to three main markets: (1) the fresh fruit market of British Columbia and the three Prairie provinces; (2) the fresh fruit trade in Eastern Canada; and (3) processing plants in British Columbia. The first named of these three markets absorbs 75 per cent, the fresh fruit trade in Eastern Canada five per cent, and the processing plants of British Columbia 20 per cent of the Okanagan Valley cherry crop. Suppliers do not have to look for market outlets; in fact, domestic demand far exceeds the supply.

In normal times the Western provinces purchase approximately 63 per cent of the Okanagan peach crop as fresh fruit, and the Eastern provinces about two per cent. The remainder is sold to processors in British Columbia.

Fifteen per cent of the Okanagan prune crop usually goes to British Columbia processors; 84 per cent is taken by the fresh fruit markets of the Western provinces, and Eastern Canada takes up one per cent of the crop as fresh fruit. Production has practically trebled since the 1935-39 period and this increase in production suggests the need for caution in planning further plantings.

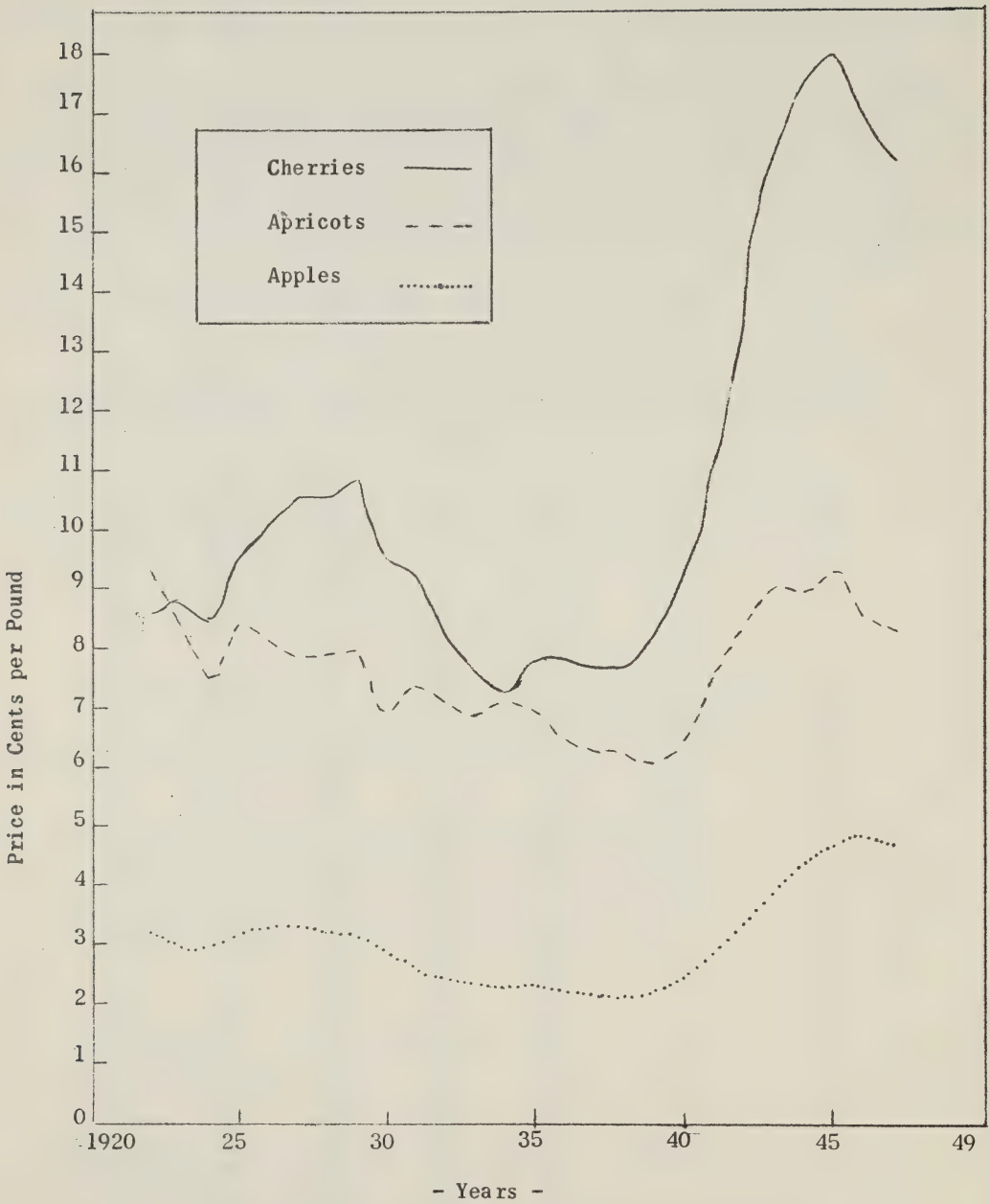
The Eastern provinces absorb 30 per cent of the Okanagan pear crop as fresh fruit, and the Western provinces 45 per cent. Processing plants in British Columbia use the remaining 25 per cent.

Prices.- Figures presented in Table 8 convey an idea of the fluctuations in prices of stone fruit, pears and apples over the years. These figures actually relate to the average prices for fruit f.o.b. the Okanagan Valley for the years 1920 to 1949 inclusive. These prices are not the prices paid to the growers but prices charged by the various selling agencies. On the whole, prices received for apricots and cherries during that period have remained constantly higher than prices paid for other kinds of fruits.

Table 8.- Average Prices of Okanagan Fruits per Pound of Packed Fruit, F.O.B. Okanagan Points, 1920-1949

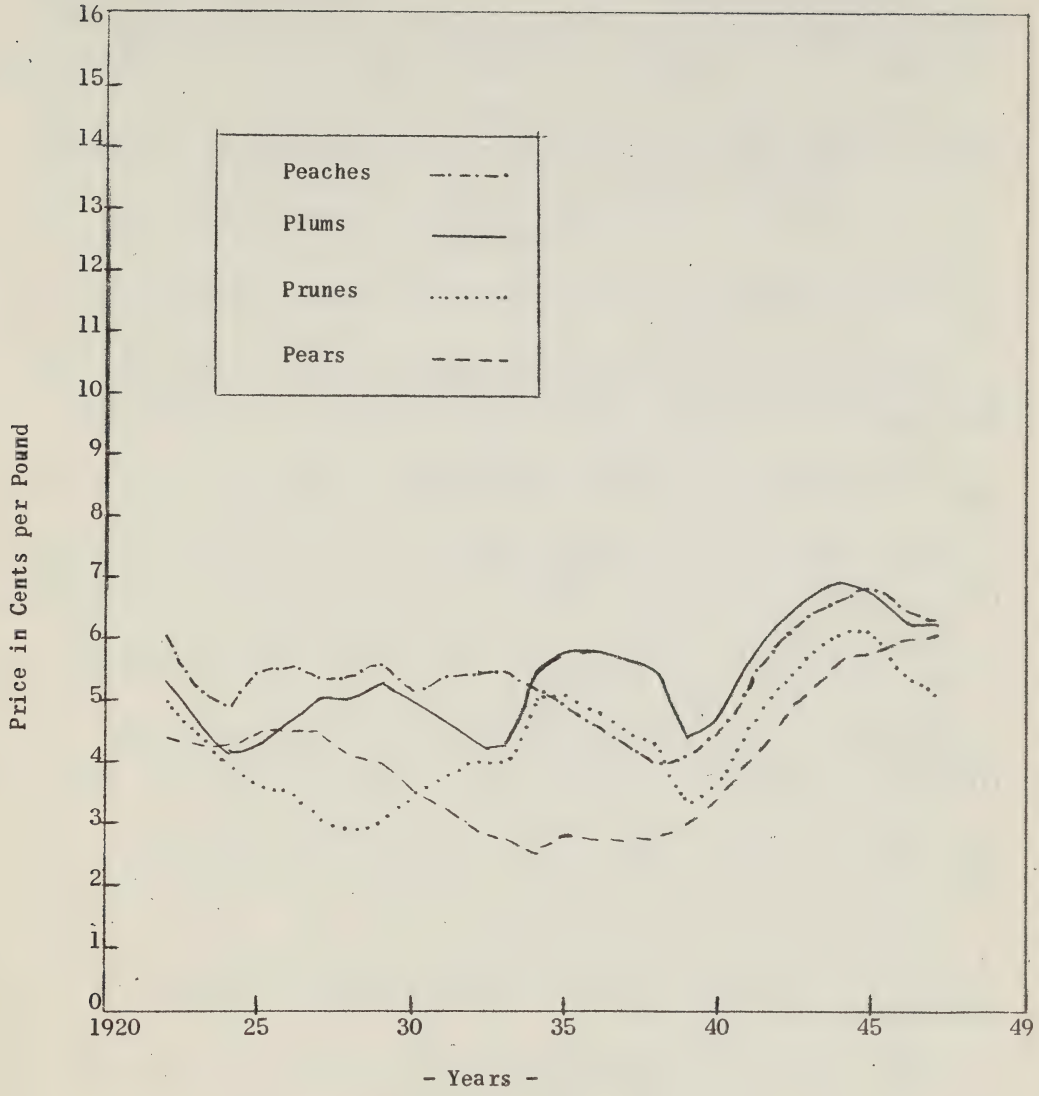
Year	Apricots	Cherries	Peaches	Plums	Prunes	Pears	Apples
				- cents -			
1920	.14	.10	.10	.08	.07	.05	.04
1921	.08	.09	.06	.06	.06	.04	.03
1922	.08	.07	.04	.03	.03	.03	.02
1923	.07	.07	.04	.04	.04	.04	.03
1924	.10	.10	.06	.05	.05	.05	.03
1925	.09	.11	.06	.05	.05	.05	.03
1926	.06	.07	.04	.03	.03	.03	.03
1927	.10	.13	.07	.04	.02	.05	.04
1928	.06	.10	.04	.06	.03	.04	.03
1929	.08	.12	.05	.08	.03	.05	.03
1930	.08	.11	.06	.05	.04	.04	.03
1931	.06	.08	.05	.04	.04	.03	.02
1932	.06	.06	.05	.02	.04	.02	.02
1933	.08	.09	.06	.05	.04	.03	.02
1934	.07	.07	.05	.05	.04	.03	.02
1935	.07	.08	.06	.05	.04	.03	.02
1936	.07	.06	.04	.11	.10	.03	.02
1937	.05	.09	.04	.04	.04	.03	.02
1938	.06	.06	.04	.05	.03	.02	.02
1939	.06	.06	.04	.04	.02	.03	.02
1940	.06	.08	.04	.04	.03	.03	.02
1941	.06	.10	.05	.05	.04	.04	.03
1942	.06	.14	.05	.06	.05	.06	.03
1943	.12	.21	.08	.09	.08	.06	.05
1944	.10	.18	.07	.07	.06	.06	.04
1945	.10	.18	.06	.06	.05	.06	.05
1946	.06	.16	.06	.06	.05	.06	.05
1947	.08	.17	.06	.05	.05	.06	.05
1948	.08	.15	.07	.07	.06	.07	.05
1949	.10	.15	.07	.08	.04	.07	.04

Source: Okanagan Federated Shippers' Association, Kelowna, B.C.



Source: Okanagan Federated Shippers' Association

Figure 5.- Average Prices of Cherries, Apricots and Apples, F.O.B. Okanagan Points, Five Year Moving Average 1920-1949



Source: Okanagan Federated Shippers' Association

Figure 6.- Average Prices of Peaches, Plums, Prunes and Pears, F.O.B. Okanagan Points, Five Year Moving Average 1920-1949

Price Received - 1949.- The average price per pound received by the 107 orchardists for their fruit in 1949 was as follows: apricots - 6.57 cents; cherries -14.54 cents; peaches - 4.85 cents; plums - 4.29 cents; prunes - 2.50 cents; pears - 4.66 cents, and apples 2.07 cents.

These are average prices for all grades and varieties. On a "per box" basis the average price received by the growers in 1949 was $1.96 for pears, and $0.86 for apples.

TERMINOLOGY

The following terms are defined in order to help the reader in his interpretation of the study.

Capital.- The average of the beginning and ending inventory values of the farm buildings, land, machinery and equipment, livestock, and feed and supplies.

Cash Receipts.- The amount of money received during the year from the sales of crops, livestock and livestock products or from custom work.

Capital Receipts.- Returns from the sale of farm machinery, equipment, buildings or land, i.e. from any good which is part of the capital investment in the farm.

Capital Expenses.- Money spent for the purchases of goods which add to the capital resources of the farm.

Crop Index.- The yield per tree expressed as a percentage of the average yield per tree. For example, a crop index of 110 would mean a yield ten per cent greater than the average for the group.

Current Expenses.- Total money paid during the year for commodities and services used in farm production. A charge for the use of unpaid family labour is also included.

Farm Income.- Gross cash income plus capital receipts and increases in inventory less current expenses and any decrease in inventory and payments on capital accounts; in other words total receipts minus total expenditures.

Labour Income.- Farm income minus interest (calculated at four per cent in this study) on average total farm capital.

Perquisites.- An estimate of the value of all products raised and consumed on the farm, plus an annual rental charge for the use of the farm house.

Operator's Labour Earnings.- Labour income plus perquisites. This represents the total return to the operator for his year's work after all cash and non-cash expenses have been deducted.

Man Equivalent.- Is the equivalent of one man working on the farm for one year, a full year consisting of 3,120 hours.

Gross Production per Man.- All the farm products, sold or consumed on the farm, divided by the number of man equivalents. It is, therefore, the total output produced by one man with the assistance of the farm capital and the land resources.

Returns to Labour and Management.- The remuneration to all labour and management used in production on the farm. It is obtained by adding expenditures for hired labour, unpaid family labour and labour earnings.

Net Production per Man.- Is the return to all labour and management divided by the number of man equivalents.

Total Man-Hours of Labour.- Total man-hours of labour used on the farm during the year.

Return per Hour of Labour.- Is the net return to all labour and management divided by the total number of man-hours of labour used on the farm during the year. It is a measure of the net productivity of the labour employed on the farm.

FARM ORGANIZATION BY REGIONS

Farm Capital

Most of the capital utilized by the 107 orchardists consists of land and fruit trees. In all five regions included in the study, orchard land accounts for more than 60 per cent of total farm investment. Buildings, machinery and equipment were the other major items of farm investment (Table 9). Buildings accounted for a larger share of the total than

Table 9.- Distribution of Average Farm Capital per Farm by Regions, 107 Okanagan Valley Orchards, 1949-1950

Description	Average per farm									
	Kelowna		Summerland		Penticton		Oliver		Osoyoos	
	$	%	$	%	$	%	$	%	$	%
Orchard land	19,765	66.4	12,852	64.6	19,187	68.5	15,378	63.6	13,955	66.0
Other land	678	2.3	377	1.9	326	1.2	1,134	4.7	484	2.3
Dwelling house	3,974	13.3	4,039	20.2	4,906	17.5	3,633	15.0	3,316	15.7
Other buildings	1,464	4.9	772	3.9	1,153	4.1	1,433	6.0	1,007	4.8
Total real estate	25,881	86.9	18,040	90.6	25,572	91.3	21,578	89.3	18,762	88.8
Orchard equipment	738	2.5	300	1.5	546	2.0	563	2.3	353	1.7
General equipment	581	2.0	381	1.9	349	1.2	419	1.7	370	1.8
Tractor, truck, auto	2,485	8.3	1,157	5.8	1,479	5.3	1,550	6.4	1,549	7.3
Livestock and supplies	81	.3	29	.2	53	.2	64	.3	96	.4
Total farm capital	29,766	100	19,907	100	27,999	100	24,174	100	21,130	100

machinery and equipment. But if the value of the farm dwelling is deducted from the value of all farm buildings, machinery and equipment then become the

second largest item of capital investment. Livestock represents an almost negligible part of the total farm capital structure.

Farms located in the Kelowna and Penticton regions had the largest capital investment per farm. The Kelowna orchards were the largest in size and those in the Penticton region had a higher value per acre.

Table 10 provides a description of the variation of farm capital. The largest group comprised 40 orchards with farm capital ranging in volume from $15,000 to $25,000. A little over 70 per cent of the orchards had an average capital investment exceeding $15,000 per farm and about 16 per cent had an average capital investment of more than $35,000 per farm.

Table 10.- Frequency Distribution of Farm Capital, 107 Okanagan Valley Orchards, 1949-1950

Farm Capital	Number of orchards	Per cent of total orchards
Less than $15,000	32	29.9
$15,000 - 24,999	40	37.4
$25,000 - 34,999	18	16.8
$35,000 and over	17	15.9
Total	107	100.0

Land Valuation.- The average value of an acre of orchard land in the five regions was as follows: Kelowna $1,166, Summerland $1,415, Penticton $2,047, Oliver $1,578 and Osoyoos $1,405. The average for all regions was $1,554 per acre. In general, the growers evaluated their orchard land on the basis of productivity, i.e. net returns per acre. The orchards with the highest valuation per acre had, on the average, the highest yields and net incomes per acre.

Table 11.- Relation of Valuation of Orchard per Acre to Net Income per Acre, 107 Okanagan Valley Orchards, 1949 - 1950

Number of orchards	Value of Orchard per Acre: Group	Value of Orchard per Acre: Average	Average: Net income per acre
		- dollars -	
46	Less than $1,499	1,044	172
32	$1,500 to $1,999	1,634	350
29	$2,000 and over	2,283	424

The main reasons for the high valuation are the productivity of the orchards and the scarcity of land with suitable environmental factors for tree fruit production.

Peach Orchard,
trees 8-10 years old

Young Peach Trees in Heavy
Cover Crop of Alfalfa, with
Sprinkler Irrigation

Young Pear Orchard Planted
on a Steep Hillside

Land Utilization.- The land use pattern of the typical farm producing stone fruit is described in Table 12.

In the Kelowna region the average stone fruit farm was approximately 19 acres in size and about 90 per cent of this acreage was in trees. Cherry and apple trees, particularly apples, were the most numerous of the various tree fruits in the orchards. Over one-half of the cherry trees were bearing whereas less than one-half of the pear trees were in this category. Most of the orchardists had some prune trees in their orchards and over one-half of these trees had been planted in the last ten years.

Peaches and apricots were the principal fruit trees on the majority of stone fruit farms of the Summerland region. A large part of the orchard was also in pear and apple trees. More peach trees than apricot trees were of bearing age. About 78 per cent of the pear trees were less than ten years of age.

Peach, pear and apple trees made up 80 per cent of all fruit trees on the average fruit farm in the Penticton region. There were fewer peach trees in the "one to five-year" age group on these farms than on farms of the Summerland region. Fifty-four per cent of the pear trees were over ten years of age.

In the Oliver region, peach and apricot trees were the main stone fruits. There was also a considerable number of pear trees and these were about equally divided into three age groups, 1-5, 6-10, and 11-15 years. As in the Summerland region, there was a greater percentage of apricot than peach trees in the 1-5 year age group. Cherries were of considerable importance and were of various ages; however, there were few trees in the six to ten year age group.

Peach trees were the main stone fruit trees on the average orchard in the Osoyoos region. Pear, cherry and apple trees covered approximately the same acreage. Eighty-four per cent of the peach trees, 60 per cent of the apricot trees, 80 per cent of the pear trees, and 94 per cent of the cherry trees were over five years of age.

Each kind of tree fruit grown in the locality is represented in the typical farm producing stone fruit . However, there is some difference in the orchard acreage utilized by each kind of fruit tree. Stone fruits, as a group, constituted the main orchard enterprise on the farms studied but apple and pear trees also accounted for a large part of the orchard.

On all the orchards the majority of the cherry and apple trees were planted 30' x 30' apart, and the other fruit trees were planted 20' x 20' apart. It is thus assumed in this study that 50 cherry or apple trees and 100 apricot, peach, plum, prune or pear trees cover one acre.

Of all the stone fruit units in the Kelowna-Osoyoos area in 1949 about 39 per cent covered an acreage averaging from two to 4.9 acres, 25 per cent an acreage ranging from five to 9.9 acres, and 23 per cent an acreage varying from ten to 14.9 acres. The remaining 13 per cent had 15 or more orchard acres. 1/

1/ Data supplied by the British Columbia Tree Fruit Board, For further details, see Appendix I.

Table 12.- Land Use by Regions, 107 Okanagan Valley Orchards, 1949-1950

Item	Average per farm									
	Kelowna (13 orchards)		Summerland (22 orchards)		Penticton (32 orchards)		Oliver (19 orchards)		Osoyoos (21 orchards)	
	Acres	Trees	Acres	Trees	Acres	Trees	Acres	Trees	Acres	Trees
Apricots	.31	34	1.89	185	1.09	118	1.69	168	1.10	122
Cherries	4.46	243	.58	31	.68	36	1.17	61	1.53	83
Peaches	1.33	144	2.96	294	2.27	242	2.20	232	3.83	449
Prunes and plums	2.17	230	.85	84	.79	82	.76	80	.65	71
Pears	1.21	134	1.40	149	1.76	192	1.26	128	1.59	169
Apples	7.77	405	1.36	74	2.89	163	2.63	138	1.38	79
Total orchard	17.25	1,190	9.04	817	9.48	833	9.71	797	10.08	973
Other crops	.81		.18		.06		.09		1.23	
Unimproved	.38		.14		.13		3.30		.29	
Farmstead	.68		.35		.50		.35		.46	
Total other land	1.87		.67		.69		3.74		1.98	
Total acreage	19.12		9.71		10.17		13.45		12.06	

Table 13 illustrates the variations in orchard acreages for the 107 orchards included in the study. Almost half of these orchards varied from five to 10 acres in size.

Table 13.- Frequency Distribution of Orchard Acreage, 107 Okanagan Valley Orchards, 1949-1950

Acres	Number of orchards	Percentage of total
Less than 5	15	14
5 to 9.9	48	45
10 to 14.9	27	25
15 and over	17	16
Total	107	100

Buildings.- The fruit enterprise requires few buildings. In the majority of cases the only buildings, beside the farm house, were inexpensive shelters for seasonal help and for machinery and equipment.

Orchard Equipment.- Orchard equipment includes sprayers, spraying costumes, picking bags, pruning shears and saws, ladders and props. The average value

of this type of equipment was $484 per orchard. Fifty growers owned sprayers and these were valued at an average of $572 per sprayer.

General Equipment.- General equipment includes such items as plows, discs, cultivators, harrows and small tools. The average total value of such items was $400 per farm.

Tractors, Trucks and Automobiles.- Tractors were owned by 77 of the 107 operators interviewed. The average value per tractor was $956, and the average cash operating expense for the year amounted to $151.

Forty growers had trucks. These trucks had an average value of $946, and average truck cash operating expenses for 1949 amounted to $266.

Seventy-five orchardists owned automobiles. Over one-half of these automobiles were eight or more years old. Each had travelled about 5,600 miles during the year and average cash operating expenses came to about 6.1 cents per mile. When the records were sorted into size groups, on a crop acreage basis, it was seen that the larger farms tended to own more equipment such as tractors, trucks, automobiles, and sprayers (Table 14).

Table 14.- Number of Tractors, Trucks, Automobiles and Sprayers, 107 Okanagan Valley Orchards, 1949-1950

Size of farm in crop acres	No. of farms	Number of farms having machine							
		Tractor		Truck		Auto		Sprayer	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent
Less than 6	22	13	59	4	18	12	54	6	27
6 - 11.9	55	42	76	19	34	42	76	23	42
12 and over	30	22	73	17	57	21	70	21	70
Total	107	77	72	40	37	75	70	50	47

Livestock.- Livestock is of little importance on these specialized fruit farms. Of the 107 farms surveyed, six per cent reported owning horses, 11 per cent had cattle, ten per cent had hogs, 45 per cent raised poultry and 16 per cent owned or rented bees. The average number kept by those farms reporting livestock was: one horse, two head of cattle, two hogs, 34 chickens and two beehives.

FARM RECEIPTS

Sources of Cash Receipts.- In 1949 the average total cash receipts for all farms was $6,016. Sixty-nine per cent of the total was derived from the sale of stone fruits, 15 per cent from the sale of apples, 11 per cent from the sale of pears and five per cent from other crops, livestock or employment off the farm.

Of the various fruits, cherries provided the highest percentage of farm cash income in the Kelowna and Oliver regions while peaches were the largest single source of cash receipts on the stone fruit farms in the other three regions. Only on the farms in the Summerland and Penticton regions did pears contribute as much as ten per cent of the total cash receipts. In the Osoyoos region ground crops such as tomatoes and cantaloupes provided almost 12 per cent of the average total cash receipts (Table 15).

It must be remembered that these figures are for one year only and that changes in yield and price will change the composition of the total farm cash income. However, these farms do depend upon stone fruits for the major part of their income but few are so specialized as to be dependent upon one particular tree fruit.

Table 15.- Sources of Cash Income, 107 Okanagan Valley Orchards, 1949-1950

Source	Kelowna (13 orchards)		Summerland (22 orchards)		Penticton (32 orchards)		Oliver (19 orchards)		Osoyoos (21 orchards)	
	$	%	$	%	$	%	$	%	$	%
Apricots	98	1.3	848	18.3	710	10.6	1,279	20.0	344	6.5
Cherries	3,908	53.7	230	5.1	1,227	18.3	1,629	25.5	1,633	30.7
Peaches	572	7.8	1,934	41.8	2,072	31.0	1,348	21.1	1,712	32.1
Plums and prunes	494	6.8	193	4.2	308	4.6	296	4.6	198	3.7
Total stone fruit	5,072	69.6	3,205	69.4	4,308	64.5	4,552	71.2	3,887	73.0
Pears	450	6.2	632	13.7	1,038	15.5	415	6.5	371	7.0
Apples	1,616	22.2	480	10.4	1,178	17.6	1,096	17.2	391	7.3
All tree fruit	7,138	98.0	4,317	93.5	6,533	97.6	6,063	94.9	4,649	87.3
Other crops	61	.9	-	-	-	-	37	.6	636	11.9
Livestock	6	.1	11	.2	126	1.8	16	.3	22	.4
Other	74	1.0	290	6.3	41	.6	260	4.2	19	.4
Total	7,299	100	4,623	100	6,700	100	6,376	100	5,326	100

Capital Receipts.- Capital receipts are returns from the sale of farm machinery, land or buildings. Receipts from these sources amounted to an average of $246 per farm.

Change in Inventory.- Increases in inventory are considered as receipts, decreases in inventory as expenses. Most farms had inventory increases during the year, over all farms the net inventory increase was $878.

FARM EXPENSES

Current Expenditures

The current operating expenses of these orchards varied greatly depending upon the location efficiency of management, yields and size of farm. The average total operating expense per farm for the whole area was $3,224.

Taken by regions, the average total current operating expenses per farm were: Kelowna $4,435, Penticton $3,635, Osoyoos $2,914, Oliver $2,753, and Summerland $2,615 (Table 15). A discussion of some of the major current expenses follows below.

Labour.- In fruit farming a large part of the yearly work is concentrated into the relatively short harvest season. Much hand labour is required and most of it must be hired. Thus it was found that the major item of expense on all farms was either hired or unpaid labour. The labour charge averaged 44.7 per cent of the total current operating expenses for all farms.

The farms in the Kelowna region utilized the most hired labour while those at Osoyoos utilized the most family labour. The variation in the amount spent on labour between the different farms is due to differences in yield, and consequently in labour requirements, between the various regions and fruits. Wages paid per hour differed between jobs and between sexes. Women were paid 55 to 65 cents per hour for picking and thinning while men were paid 70 to 75 cents per hour for similar tasks. For some fruits, the pickers were paid by the box. The most common rates paid were 20 cents per box of apricots, 45 cents per box of cherries, 18 cents per box of prunes, and ten cents per box of pears.

Operating Expenses.- The fuel, oil, grease and repairs necessary to operate the tractors, trucks, autos, sprayers and other equipment was the second largest item of expense, averaging 11.2 per cent of the total current expenses for all farms. This charge was largest on the farms in the Kelowna region as these farms were the most highly mechanized.

Fertilizers.- The fertilization of fruit trees is a common practice; 104 of the 107 operators applied some commercial fertilizer or manure or both to their trees. The amount spent on fertilizers was 7.3 per cent of the total current expenses over all the farms. Expenditures for this item were largest on the farms in the Osoyoos region, due to the fertilizer requirements of the ground crops grown in this locality.

The most common fertilizers applied were 16-20-0, sulphate of ammonia and ammonium nitrate. Twenty-six per cent of the growers applied boron, which, as mentioned previously, is an element deficient in Okanagan soils. Although manure is scarce in the Okanagan Valley, 25 per cent of the growers purchased some at an average cost of $5 per ton.

Cover crops were used on 105 of the orchards. They consisted of all kinds of plants such as alfalfa, clover, vetch, grass or weeds.

Irrigation.- As mentioned earlier there are several irrigation districts in the survey area. The amount spent on irrigation varied between the farms and regions depending upon the irrigation district from which they received their water and the amount of water used. For all farms irrigation, taxes and maintenance amounted to 5.2 per cent of the total current expenses or $169 per farm per year.

In recent years the use of sprinkler systems to irrigate the orchards has become widespread. However, there are many orchardists who use the furrow method because it is not feasible to make the change. In 1949, 38 of the 107 operators irrigated only with sprinklers, while 48 irrigated only with furrows. The remaining 21 had both systems of irrigation. On the orchards using only sprinklers, an average of 28 man hours per acre per annum was spent on irrigation, while those using only furrow irrigation spent an average of 35 man hours per acre per annum. The cost of maintenance and repairs was greater for the sprinkler systems than for the furrow systems. Fourteen of the growers who had recently installed sprinkler systems estimated the cost of installation to be $144 per acre.

Table 16.- Distribution of Current Expenses by Regions, 107 Okanagan Valley Orchards, 1949-1950

Item of expense	Average per farm									
	Kelowna (13 orchards)		Summerland (22 orchards)		Penticton (32 orchards)		Oliver (19 orchards)		Osoyoos (21 orchards)	
	$	%	$	%	$	%	$	%	$	%
Hired labour	2,303	51.9	1,242	47.5	1,723	47.4	1,212	44.1	899	30.9
Unpaid labour	119	2.7	119	4.6	113	3.1	296	10.8	422	14.5
Operation of equipment	624	14.1	335	12.8	361	9.9	262	9.5	313	10.8
Fertilizers	314	7.1	173	6.6	188	5.2	189	6.9	343	11.8
Irrigation	243	5.5	158	6.0	193	5.3	111	4.0	151	5.2
Spray material	215	4.8	81	3.1	160	4.4	132	4.8	122	4.2
Custom work	170	3.8	231	8.8	297	8.2	186	6.8	230	7.9
Land taxes	67	1.5	120	4.6	211	5.8	84	3.1	89	3.0
Trees bought	67	1.5	36	1.4	45	1.2	39	1.4	51	1.8
Insurance	41	.9	17	.6	59	1.6	18	.6	12	.4
Electricity	14	.3	1	.0	11	.3	23	.8	32	1.1
Telephone	16	.4	17	.6	20	.6	12	.4	-	-
Bee rental	5	.1	-	-	5	.1	7	.3	3	.10
Cull charges	48	1.1	5	.2	15	.4	19	.7	16	.5
Hired bookkeeping	11	.2	2	.1	8	.2	3	.1	3	.1
Feed and seed	90	2.0	50	2.0	123	3.4	48	1.7	137	4.7
Building repairs	33	.8	9	.3	18	.5	29	1.1	16	.5
Short term interest	23	.6	4	.2	29	.8	47	1.7	17	.6
Small hardware	20	.5	13	.5	22	.6	18	.6	19	.6
Miscellaneous	12	.2	2	.1	34	1.0	18	.6	39	1.3
Total	4,435	100	2,615	100	3,635	100	2,753	100	2,914	100

Spray Material.- The cash outlay for the various kinds of spray material amounted to three to five per cent of the total current expenditures. The general practice on these orchards was to begin the spray schedule with the application of lime sulphur and oil to the dormant trees in March or early April. The grower then continued his spray program throughout the season by applying two or three cover sprays of D.D.T., Parathion or other materials as conditions may require. Some diseases and pests which were sprayed for were leaf curl, mildew, pear psylla, coddling moth, mites and aphids.

Custom Work.- The expenditure for custom work was the third largest current expenditure on the average farm. This outlay was made for such jobs as spraying, tractor work or hauling the fruit to the packing houses. The usual charges for such tasks were $4.00 per hour for spraying, $3.50-$4.00 per hour for tractor work, and two or three cents per box for hauling fruit.

Land Taxes.- Land taxes were highest on the farms in the Penticton region and lowest on the orchards in the Kelowna region. The average land taxes per orchard acre and per $1,000 invested are illustrated in Table 17.

Table 17.- Average Taxes per Acre and per $1,000 Worth of Farm Value by Regions, 107 Okanagan Valley Orchards, 1949-1950

Region	Taxes per acre	Per $1,000 worth of real estate
	- dollars -	
Penticton	20.76	8.26
Summerland	12.31	6.64
Osoyoos	7.82	4.75
Oliver	6.26	3.91
Kelowna	3.52	2.61
All farms	10.71	5.83

Insurance.- As with other types of farming the orchardists face the usual hazards of frost, fire, hail and occupational risks. Some of these risks can be insured against, some cannot. In 1949 the majority of the growers insured their buildings against fire, 18 per cent had some form of employee liability to protect themselves and their seasonal help. A few of the orchards had hail insurance. Since this survey was made, a Mutual Hail Insurance Company has been organized by the growers.

Capital Expenditures

During the year 1949-1950 the average grower added $1,487 worth of equipment or improvements to the farm business. There was very little difference in the amount spent on the farms in the various regions.

FINANCIAL SUMMARY

The average difference between total farm receipts and total farm expenses on all farms studied was $2,429. This figure, called "farm income" is the amount the operator received for his work on the farm and interest on invested capital. In order to obtain the return to the operator for his labour, interest at four per cent was deducted from the farm income leaving an average "labour income" of $1,448. In addition to labour income, the farmer receives for his labour and management the use of the farm home and products raised and consumed on the farm. These "perquisites" when added to labour income, give the measure known as operator's "labour earnings". The operator's labour earnings represent the total returns to the operator for his labour and management after all cash and non-cash expenses are deducted. The average value of perquisites for the 107 farms surveyed was $592 which, added to the labour income, gave labour earnings amounting to $2,040 per farm.

During the year the income available for family living would be greater than the amount listed as labour earnings. If the farm is free of debt, interest charged on farm capital would be at the farmer's disposal. The amount charged for family labour is also a non-cash expense and this amount would also be available for family living.

Table 18.- Financial Summary by Regions, 107 Okanagan Valley Orchards, 1949 - 1950

	Kelowna (13 orchards)	Summerland (22 orchards)	Penticton (32 orchards)	Oliver (19 orchards)	Osoyoos (21 orchards
			- dollars -		
Cash receipts	7,279	4,623	6,700	6,376	5,326
Capital receipts	12	432	90	536	170
Net inventory increase	570	1,387	988	76	1,079
Total farm receipts	7,861	6,442	7,778	6,988	6,575
Current expenses	4,435	2,615	3,635	2,753	2,914
Capital expenses	1,124	1,957	1,488	1,064	1,587
Net inventory decrease	-	-	-	-	-
Total farm expense	5,559	4,572	5,123	3,817	4,501
Farm income	2,302	1,870	2,655	3,171	2,074
Interest on capital	1,191	796	1,120	967	845
Labour income	1,111	1,074	1,535	2,204	1,229
Perquisites	724	526	644	535	552
Labour earnings	1,835	1,600	2,179	2,739	1,781

Main Irrigation Flume, South Okanagan Lands Project between Oliver and Osoyoos

Effects of the Severe Winter of 1949-50 on Some Cherry Trees

Apricot Orchard,
left, 7-9 year old trees,
right, 2-4 year old trees

In the year 1949 the average debt per farm surveyed was $1,577. Interest on $1,577 at four per cent amounts to $63; when subtracted from $981, the amount charged as interest on the total farm investment, an additional $918 is left as a cash return to the orchardist. This $918 plus the operator's labour earnings of $2,040 and the amount charged for unpaid family labour, which averaged $209 per farm, gave a total of $3,167 available for family living in 1949 on the average farm taking part in the study.

In Table 18 the average total farm receipts, expenses, farm income, labour income and labour earnings is presented. Oliver orchardists received the highest labour earnings, Penticton orchardists followed, then Kelowna, Osoyoos and Summerland orchardists.

VARIATIONS IN RETURNS

The labour earnings for the 107 orchards varied from - $1,293 to $11,059. It will be noted that most of the orchards were in the $1,000 to $1,999 group. Twenty-two of the orchardists had labour earnings of $3,000 or more while 15 had minus labour earnings (Table 19).

Table 19.- Frequency Distribution by Labour Earnings, 107 Okanagan Valley Orchards, 1949 - 1950

Labour earnings	Number of orchards	Per cent of total orchards
Plus		
$5,000 or more	11	10
$4,000 to $4,999	4	4
$3,000 to $3,999	7	6
$2,000 to $2,999	22	21
$1,000 to $1,999	28	26
$1 to $999	20	19
Minus		
$1 to $999	11	10
$1,000 to $1,999	4	4
Total	107	100

The question then arises why was there such a wide variation in the labour earnings of these orchardists? A few of the many reasons are: differences in yield, size of farm, kind and grade of fruit produced, efficiency of labour and management, location and the degree of diversification. All of these factors do have a direct bearing on the size of the producer's earnings. In the following section the effect of four of these factors, namely: yield, size, labour efficiency and diversification will be illustrated.

Yield.- As a means of putting the yields of all the fruits on a common basis, the yields of apricots, cherries, peaches, plums and prunes, pears and apples were expressed as a percentage of the average of the area. Such a measure is called a crop index.

In the group of orchards with a crop index of less than 70 the average labour earnings per farm were $681, while those orchards with a crop index of 130 or more had average earnings of $2,762. Thus the difference between the average labour earnings of these four groups was due in large measure to the economy of high-yielding trees.

Table 20.- Crop Index and Labour Earnings, 107 Okanagan Valley Stone Fruit and Pear Orchards, 1949-1950

Crop index	Number of orchards	Average per orchard	
		Crop index	Labour earnings
		- per cent -	- dollars -
Less than 70	15	46	681
70 - 99	34	83	1,806
100 - 129	32	114	2,332
130 or more	26	155	2,762

Size.- The size of the farm business may be measured in many different ways, for example: by crop acres, by total capital, or by the volume of farm production. The volume of farm production is used in this case because it is probably one of the best single measures of size when different types of fruit farms in different regions are being compared.

Table 21.- The Relation of Yield and Size to Labour Earnings, 107 Okanagan Valley Orchards, 1949-1950

Group	Volume of production	Number of orchards	Average per farm		
			Crop index	Volume of production	Labour earnings
	- dollars -		- per cent	- dollars -	
I					
Crop index 105 or under	1-4,999	23	71	3,147	541
	5,000-7,499	18	78	6,054	1,297
	7,500-9,999	3	69	8,405	2,079
	10,000 and over	10	87	14,313	2,740
II					
Crop index 106 or more	1-4,999	9	144	3,450	565
	5,000-7,499	16	145	3,450	565
	7,500-9,999	10	129	8,679	2,891
	10,000 and over	18	130	15,145	4,452

In order to modify the effect of yield the records were first sorted on the basis of their crop indexes. Group I included those orchards having a crop index of 105 or less; Group II, those orchards having a crop index of 106 or more. Each group was then sub-sorted on the basis of their volume of production. In both groups as the size of the farm business increased labour earnings increased (Table 21).

Labour Efficiency.- As shown, yield and size of farm do have an important influence on the operator's returns. Another important factor influencing the size of labour earnings is the amount the operator and the labour he employs produce per day or per hour. A measure of the productivity of all the labour employed on these farms is the Net Production per Man Unit, which is total receipts less all expenses except labour, divided by the number of man equivalents. 1/

To compare the relative efficiencies of the different orchards, "income statements", such as the one following, were prepared. It is the average for all the 107 orchards surveyed (Table 22).

Table 22.- Average Orchard Income Statement, 107 Okanagan Valley Orchards 1949 - 1950

		: Dollars	
1.	Cash receipts	6,016	
2.	Capital receipts	246	
3.	Inventory increase	1,103	
4.	Total receipts	7,365	
5.	Current expense (excluding unpaid labour)	3,015	
6.	Capital expense	1,487	
7.	Inventory decrease	225	
8.	Total expenses	4,727	
9.	Net farm income (4-8)	2,638	
10.	Four per cent interest on investment	981	
11.	Operator's and family labour (9-10)	1,657	
12.	Unpaid family labour	209	
13.	Operator's labour income (11-12)	1,448	
14.	Perquisites	592	
15.	Operator's labour earnings (13 + 14)	2,040	
16.	Amount paid for hired labour	1,442	
17.	Return to all labour and management (12 + 15 + 16)	3,691	
18.	Total farm production (4 + 14)	7,957	
19.	Man equivalents	1.62	
20.	Gross production per man (18 ÷ 19)	4,907	
21.	Total man hours of labour	5,058	hours
22.	Net return per hour of labour used (17 ÷ 21)	73	cents
23.	Net production per man (17 ÷ 19)	2,276	
24.	Capital investment (excluding house)	20,447	
25.	Capital per man (24 ÷ 19)	12,610	

1/ Man equivalent is the equivalent of one man working on the farm for one year, a full year consisting of 3,120 hours.

The net return to all labour and management was $3,691 made up of unpaid family labour, $209, operator's labour earnings, $2,040, and hired labour, $1,442. The net return per man was $2,276 or on an hourly basis the net return per hour of labour used was 73 cents.

Productivity per Man and Labour Earnings.- The records were first sorted into two groups on the basis of their crop indexes. This was a means of holding the effect of yield fairly constant. Group I included those orchards having a crop index of 105 or less whereas Group II included those orchards having a crop index of 106 or more. The records in each of the two groups were then sorted on the basis of net productivity per man. In both groups as productivity per man increased operator's labour earnings increased (Table 23).

Table 23.- Relation of Yield and Net Productivity to Labour Earnings, 107 Okanagan Valley Orchards, 1949-1950

Group	Net productivity per man	Number of orchards	Average per farm: Crop index	Net productivity per man	Labour earnings
	- dollars -		- per cent -		- dollars -
I					
Crop index 105 or under	0-1,499	25	71	830	168
	1,500-2,999	19	78	2,230	2,079
	3,000-4,499	10	90	3,427	2,944
	4,500 and over	0	-	-	-
II					
Crop index 106 or more	0-1,499	15	132	1,088	346
	1,500-2,999	18	142	2,183	2,185
	3,000-4,499	14	136	3,647	4,175
	4,500 and over	6	131	5,706	7,826

Diversity.- As stated previously there were few orchards made up solely of one particular fruit. Some orchards, however, were more diversified than others. Diversification was measured by the number of sources of income which yielded $1,000 or more. To determine the effect of diversity on labour earnings the records were first sorted into two groups on the basis of their crop indexes and then sub-sorted on the basis of the number of sources providing $1,000 gross income or more. In both groups as the number of sources of income increased, labour earnings increased (Table 24). With increased diversity the orchardists would normally be able to utilize their labour and equipment more effectively.

As indicated in Tables 20, 21, 23 and 24, four of the many factors affecting the profitability of stone fruit farming in 1949 were: yields, size of the farm business, labour efficiency and farm diversification. These results are summarized in Table 25. The records were sorted into three groups on the basis of their labour earnings. Group I include the

one-third of the records which had the lowest labour earnings, Group II the third having middle labour earnings, and Group III the third of the records having the largest labour earnings.

Table 24.- Relation of Yield and Diversity to Labour Earnings, 107 Okanagan Valley Orchards, 1949-1950

Group	Number of sources of $1,000 gross income or more	Number of orchards	Average Crop index	Average Labour earnings
			- per cent -	- dollars -
I				
	0	14	63	383
Crop index	1	19	81	888
105 or under	2	12	77	1,853
	3 or more	9	88	2,760
II				
	0	2	117	-612
Crop index	1	12	144	2,238
106 or more	2	22	135	2,280
	3 or more	17	134	4,298

Table 25.- Relationship of Size of Farm, Yield, Diversity and Net Production per Man to Labour Earnings, 107 Okanagan Valley Orchards, 1949-1950

Factors	Unit	Lowest labour earnings	Middle labour earnings	Highest labour earnings
Records	number	36	35	36
Crop acres per farm	acres	9.7	11.0	12.8
Volume of production	dollars	4,704	7,106	11,540
Crop index	per cent	90	108	117
Number of sources of income $1,000 or more	number	.9	1.8	2.6
Net production per man	dollars	803	2,156	3,700
Operator's labour earnings	dollars	243	1,655	4,466

The operators who received the highest labour earnings had the largest farms, averaging over 12 crop acres per farm and having a volume of production of over $11,000 per farm. They also had the highest average yields and were the most diversified. This group of farmers used their labour most efficiently, having an average net production per man of $3,700. This was the only group in which the operator's labour earnings exceeded the average net productivity per man. In other words, in the other two groups the returns to hired and family labour were greater than those received by the operators.

These influences on labour earnings should be considered simply as some of the more obvious and important ones. There are so many factors affecting farm returns that no single one can be expected to account for any large percentage of the differences existing between individual farms.

The majority of the orchardists having minus labour earnings in 1949 were situated in the Osoyoos, Summerland and Kelowna regions. Some of the main reasons why this was the case may be found by examination of the data in Tables 3 and 15.

In Table 3 it may be seen that in the Kelowna region the average yields per tree of apricots, cherries, prunes and apples were lowest of all the five regions. The average yield per tree of apricots, peaches, pears and apples in the Osoyoos region were also lower than in the Penticton and Oliver regions. In the Summerland region the average yields of apricots, cherries and prunes were also very low.

In Table 15 the sources of farm cash income are illustrated. Examination of this table for the number of sources which provided $1,000 or more of the farm income reveals that there was a difference in the degree of diversification between the orchards in the various regions.

The number of sources which provided $1,000 or more of the farm income in the various regions was as follows:

Kelowna, two sources - cherries and apples
Summerland, one source - apricots
Penticton, four sources - cherries, peaches, pears and apples
Oliver, four sources - apricots, cherries, peaches and apples
Osoyoos, two sources - cherries and peaches

In other words the average orchard in the Osoyoos, Summerland and Kelowna regions was less diversified than the orchards in the other two regions.

Being low in the two factors, yield and diversity, helped to pull down the average operator's labour earnings in the Osoyoos, Summerland and Kelowna regions below those of the average orchardist in the Penticton and Oliver regions.

EXPENSES, LABOUR REQUIREMENTS, NET RETURNS PER ACRE

Expenses

The average total expenditures required to produce an acre of apricots, cherries, peaches, prunes or pears in certain regions of the Okanagan Valley are listed in Tables 26 and 27. All expenses have been taken into account except a wage for the operator. The various items of expense are listed under four headings: Labour, Material, General, and Overhead Expenses. The expenditures for such items as labour, fertilizer, spray material and custom work are amounts which the operator estimated were spent on the particular fruit; other expenses such as taxes and interest on capital have been apportioned on the basis of specific tree acreage to total crop acreage.

Figures on expenditures per acre of apricots were secured from orchards located in the Summerland, Penticton and Oliver regions; for cherries from the Kelowna, Penticton, Oliver and Osoyoos regions; for peaches from the Summerland, Penticton, Oliver and Osoyoos regions; for prunes from the Kelowna, Summerland and Penticton regions; and for pears from the Summerland, Penticton and Osoyoos regions.

Because the records are from different localities and as the various tree fruits differ in their bearing age, labour requirements and productivity, the expenditures per acre for each kind of fruit differ.

Labour.- From Tables 26 and 27 it may be seen that labour, both hired and unpaid, made up 43.1 per cent of the total expenditures per acre of apricots; 55.3 per cent of the total spent per acre of cherries; 42.3 per cent of the total spent per acre of prunes; 28.5 per cent of the total spent per acre of pears. The variation in these percentages is due to differences in yield and consequent labour requirements for the particular fruits.

Material.- Material expenses made up of fertilizers and spray material averaged $41.01 per acre for apricots; $59.52 per acre for cherries; $38.18 per acre for peaches; $36.57 per acre for prunes; and $60.61 per acre for pears. Pears were the only fruit for which the expenditures for spray material were greater than for fertilizer. One reason for this might be the fact that the pear trees received an additional cover spray.

An average of 635 pounds of commercial fertilizers of a wide variety of mixtures was applied per acre of apricot trees, 969 pounds per acre of cherry trees, 752 pounds per acre of peach trees, 509 pounds per acre of prune trees, and 627 pounds per acre of pear trees.

General.- Use of equipment, including fuel and repairs for the tractors and trucks was the second largest item of expense per acre. It amounted to over 12 per cent of the total expenses in all cases. Custom work was another major item of expense averaging about five per cent of the total expenses per acre for all fruit.

Other expenses were charges for items such as culls, boxes, short-term interest, trees and bee rental.

Overhead.- The orchard land and buildings usually constitute an operating unit. Such expenses as depreciation, interest on capital and taxes on land and for water cannot be readily shifted. These items, designated as overhead expenses, amounted to 24.2 per cent of the total expenditures in producing an acre of apricots, 14.8 per cent for cherries, 21.4 per cent for peaches, 26.6 per cent for prunes, and 29.9 per cent for pears. Interest was the major overhead expense in all cases.

Table 26.- Total Expense in Producing an Acre of Apricots in the Summerland, Penticton, Oliver Region and an Acre of Cherries in the Kelowna, Penticton, Oliver, Osoyoos Region 1949-1950

Item of Expense	Kind of fruit: Apricots (14 orchards)		Cherries (14 orchards)	
	$	%	$	%
Labour				
Hired	234.79	39.7	310.37	54.3
Family	20.15	3.4	5.81	1.0
Material				
Fertilizers	32.73	5.5	50.33	8.8
Spray	8.28	1.4	9.19	1.6
General				
Use of equipment	101.57	17.2	68.55	12.1
Custom work	30.04	5.1	20.23	3.5
Telephone, electricity	1.57	.3	1.98	.3
Fire and liability insurance	1.40	.2	2.78	.5
Irrigation repairs	2.05	.3	7.67	1.3
Other	15.98	2.7	10.26	1.8
Overhead				
Land taxes	15.57	2.7	6.11	1.1
Interest	95.96	16.2	58.57	10.2
Water taxes	20.77	3.5	14.25	2.5
Use of building	11.12	1.9	6.00	1.0
Total	591.98	100.0	572.10	100.0

Table 27.- Total Expense in Producing an Acre of Peaches in the Summerland, Penticton, Oliver and Osoyoos Regions, an Acre of Prunes in the Kelowna, Summerland, Penticton Region and an Acre of Pears in the Summerland, Penticton, Osoyoos Regions 1949-1950

Items of Expense	Kind of fruit					
	Peaches (29 orchards)		Prunes (11 orchards)		Pears (21 orchards)	
	$	%	$	%	$	%
Labour						
Hired	142.98	35.6	132.05	31.2	148.59	26.5
Family	26.94	6.7	30.52	7.2	11.24	2.0
Material						
Fertilizers	28.30	7.1	21.52	5.1	27.09	4.8
Spray	9.88	2.4	15.05	3.6	33.52	6.0
General						
Use of equipment	65.12	16.2	80.15	19.0	114.91	20.5
Custom work	28.33	7.0	22.65	5.4	34.26	6.1
Telephone and electricity	3.55	.9	1.81	.4	3.83	.7
Fire and liability insurance	1.30	.3	2.67	.6	4.23	.8
Other	6.47	1.6	2.34	.6	14.52	2.6
Overhead						
Land taxes	13.04	3.3	20.84	4.9	26.93	4.8
Interest	56.36	14.0	65.46	15.5	108.72	19.4
Water taxes	12.42	3.1	22.42	5.3	23.44	4.2
Use of building	4.01	1.0	4.02	.9	7.95	1.4
Total	401.87	100.0	422.68	100.0	560.67	100.0

Labour Requirements

The total amount of man-labour required to produce an acre of apricots in 1949 averaged 469.2 hours. To produce an acre of cherries, an average of 555 hours was required; an acre of peaches required 384.3 hours; an acre of prunes 241.7 hours, and an acre of pears 350.7 man-hours of labour (Table 28).

For purposes of analysis the orchard operations were classified under two main headings: (1) those operations concerned with the care and development of the fruit, (2) those operations concerned with harvesting and movement of the crop.

In the first group of operations, termed "pre-harvest", are such items

as fertilizing, pruning and removing brush, cultivating, spraying, propping, irrigating and thinning. In the second group, termed "harvesting" are such operations as distributing boxes, picking, loading and hauling and collecting unused boxes.

Table 28.- Man-Hours of Labour per Bearing Acre, Stone Fruits and Pears, 95 Okanagan Valley Orchards, 1949-1950 a/

Operation	Apricots		Cherries		Peaches		Prunes		Pears	
	Hrs.	%	Hrs.	%	Hrs.	%	Hrs.	%	Hrs.	%
Pre-Harvest										
Fertilizing	4.6	1.0	7.5	1.4	2.9	.8	6.6	2.7	5.2	1.5
Pruning and removing brush	62.2	13.3	25.0	4.5	73.1	19.0	42.3	17.5	76.2	21.7
Repairing	-	-	1.0	.2	.4	.1	.2	.1	2.2	.62
Cultivating	8.4	1.8	2.0	.4	3.2	.8	8.3	3.4	7.6	2.2
Spraying	7.4	1.6	6.0	1.1	4.9	1.3	7.3	3.0	12.6	3.7
Propping	2.8	.6	-	-	2.7	.7	6.7	2.8	6.2	1.8
Irrigating	57.6	12.3	23.5	4.2	40.6	10.6	34.5	14.3	38.4	10.9
Thinning	73.3	15.6	-	-	94.1	24.5	-	-	77.3	22.0
Total Pre-Harvest	216.3	46.2	65.0	11.8	221.9	57.8	105.9	43.8	225.7	64.4
Harvesting										
Distributing boxes	14.6	3.0	13.0	2.3	11.0	2.7	7.6	3.1	10.3	2.9
Picking	229.7	49.0	469.0	84.5	140.1	36.5	123.5	1.1	107.7	30.7
Loading and hauling	5.8	1.2	7.0	1.3	11.0	2.9	4.4	1.8	6.7	1.9
Collecting boxes	2.8	.6	1.0	.1	.3	.1	.5	.2	.3	.1
Total Harvesting	252.9	53.8	490.0	88.2	162.4	42.2	135.8	56.2	125.0	35.6
Total Labour	469.2	100	555.0	100	384.3	100	241.7	100	350.7	100

a/ Number of trees per acre: Apricots, peaches, prunes and pears = 100; cherries - 50. Yield per acre: Apricots 8.9 tons, cherries 4.9 tons, peaches 7 tons, prunes 8.3 tons, and pears 8.8 tons.

The operations grouped together as "pre-harvest" accounted for 46.2 per cent of the total man-hours in the case of apricots, 11.8 per cent in the case of cherries, 57.8 per cent in the case of peaches, 43.8 per cent for prunes and 64.4 per cent of the total man-hours required for pears. For apricots, peaches and pears, thinning was the largest pre-harvest operation. In the production of cherries and prunes, pruning and removing the brush took the most time.

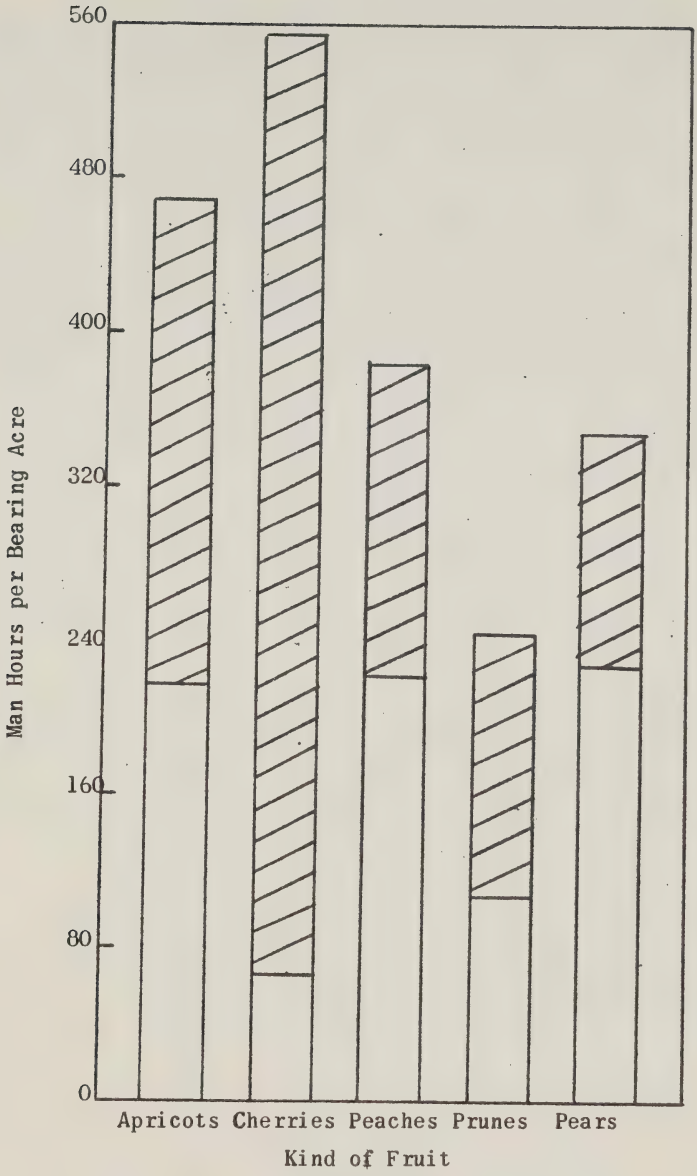


Figure 7.- Man Hours Required to Produce One Acre of Stone Fruits or Pears, 107 Okanagan Valley Orchards 1949 - 1950

Harvesting operations called for an average of 252.9 hours for apricots, 490.0 hours for cherries, 162.4 for peaches, 135.8 hours for prunes, and 125 hours for pears. For all fruits the harvesting operation which required the most labour was picking, over 35 per cent of the total labour in all cases.

To pick an acre of cherries with an average yield of 4.9 tons, took more than twice the labour required by all other fruits except apricots.

Influence of Yield on Labour Requirements

One would expect that as the yield per acre of the various fruits increases, the time required for some of the orchard operations, especially harvesting operations, would increase, whereas the time required for most of the pre-harvest operations would be relatively the same. To test this hypothesis the records dealing with the peach enterprise were divided into two groups.

1. Those with yields below the average yield of seven tons per acre.

2. Those with yields above seven tons per acre.

The records dealing with the pear enterprise were similarly divided into two groups on the basis of yield.

Table 29.- The Effect of Yield on the Number of Man-Hours Required for Various Orchard Operations, 53 Okanagan Valley Orchards, 1949-1950

Item	Kind of fruit			
	Peaches		Pears	
	Yield below Average	Yield below Average	Yield below Average	Yield below Average
	14 orchards	16 orchards	12 orchards	11 orchards
Average yield per acre	4.3 tons	10.4 tons	6.7 tons	13.10 tons
Pre-Harvest				
Fertilizing	2.3 hours	3.7 hours	3.2 hours	2.6 hours
Pruning	69.0 "	78.3 "	60.3 "	91.8 "
Spraying	4.2 "	6.0 "	5.1 "	14.9 "
Propping	2.3 "	3.3 "	2.2 "	3.0 "
Cultivating	3.2 "	3.3 "	8.0 "	8.1 "
Irrigating	41.8 "	39.3 "	38.0 "	46.6 "
Thinning	75.9 "	116.9 "	61.9 "	74.4 "
Total Pre-Harvest	198.7 hours	250.8 hours	178.7 hours	241.4 hours
Harvesting				
Distributing boxes	9.6 hours	12.2 hours	8.8 hours	11.1 hours
Picking	111.6 "	175.8 "	86.4 "	154.4 "
Loading and hauling	7.7 "	15.3 "	4.9 "	10.3 "
Total Harvest	128.9 hours	203.3 hours	100.1 hours	175.8 hours
Total Labour	327.6 hours	454.1 hours	278.8 hours	417.2 hours

In Table 29 the average time spent in producing an acre of peaches and pears at two levels of yield is illustrated. As the yield per acre increased, the time required to thin and harvest the crop increased. Although some of the variation is due to variations in labour efficiency, topography, age of trees and equipment used, the table does illustrate that such orchard operations as thinning, propping, picking, loading and hauling are most influenced by yield.

Net Returns per Acre

Net returns are the difference between total receipts and total expenses. Table 30 lists the average yield, gross returns, total expenses and net returns per bearing acre for stone fruits and pears. These are the averages of the orchards in the regions where a breakdown of expenses and labour to one particular fruit was made (Tables 26 and 27).

Table 30.- Average Yield, Gross Returns, Total Expenses and Net Returns per Bearing Acre a/ of Stone Fruits and Pears, 89 Okanagan Valley Orchards, 1949-50

Item	Kind of fruit				
	Apricots (14 orchards)	Cherries (14 orchards)	Peaches (29 orchards)	Prunes (11 orchards)	Pears (21 orchards)
- average -	- per acre -				
Average yield	9.1 tons	4.9 tons	7.2 tons	8.3 tons	9.4 tons
Gross returns	$1226.72	$1447.37	$694.41	$397.00	$878.26
Total expenses	$ 591.98	$ 372.10	$401.87	$422.68	$560.67
Net returns	$ 634.47	$ 875.27	$292.54	-$ 25.63	$317.59

a/ Number of trees per acre: Apricots, peaches, prunes, pears = 100; cherries = 50.

The average net return in 1949 from an acre of apricots was $634.74, from an acre of cherries $875.27, from an acre of peaches $292.54, from an acre of prunes -$25.63 and from an acre of pears $317.59. The order of profitability was, therefore, cherries, apricots, pears, peaches. Prunes were unprofitable in 1941; the crop on the whole was of poor quality and part of it was dumped.

APPENDIX I

Distribution of Okanagan Valley Stone Fruit Orchards by Size of Orchard, 1949

District	Size of Orchard in Acres						
	2 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 24.9	25 and over	Total
	- number of orchards -						
Kelowna and Rutland	15	9	7	5	1	4	41
Westbank	3	4	3	0	2	3	15
Peachland	15	13	3	2	1	1	35
Summerland	50	26	21	5	4	3	109
Penticton and Naramata	45	27	24	9	3	7	115
Kaleden and Okanagan Falls	9	4	2	0	2	0	17
Keremeos and Cawston	6	3	4	1	9	0	23
Oliver	56	34	39	5	4	2	140
Osoyoos	36	29	32	2	4	0	103
Total	235	149	135	29	30	20	598

Source: British Columbia Tree Fruit Board, Kelowna, B.C., 1949.

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